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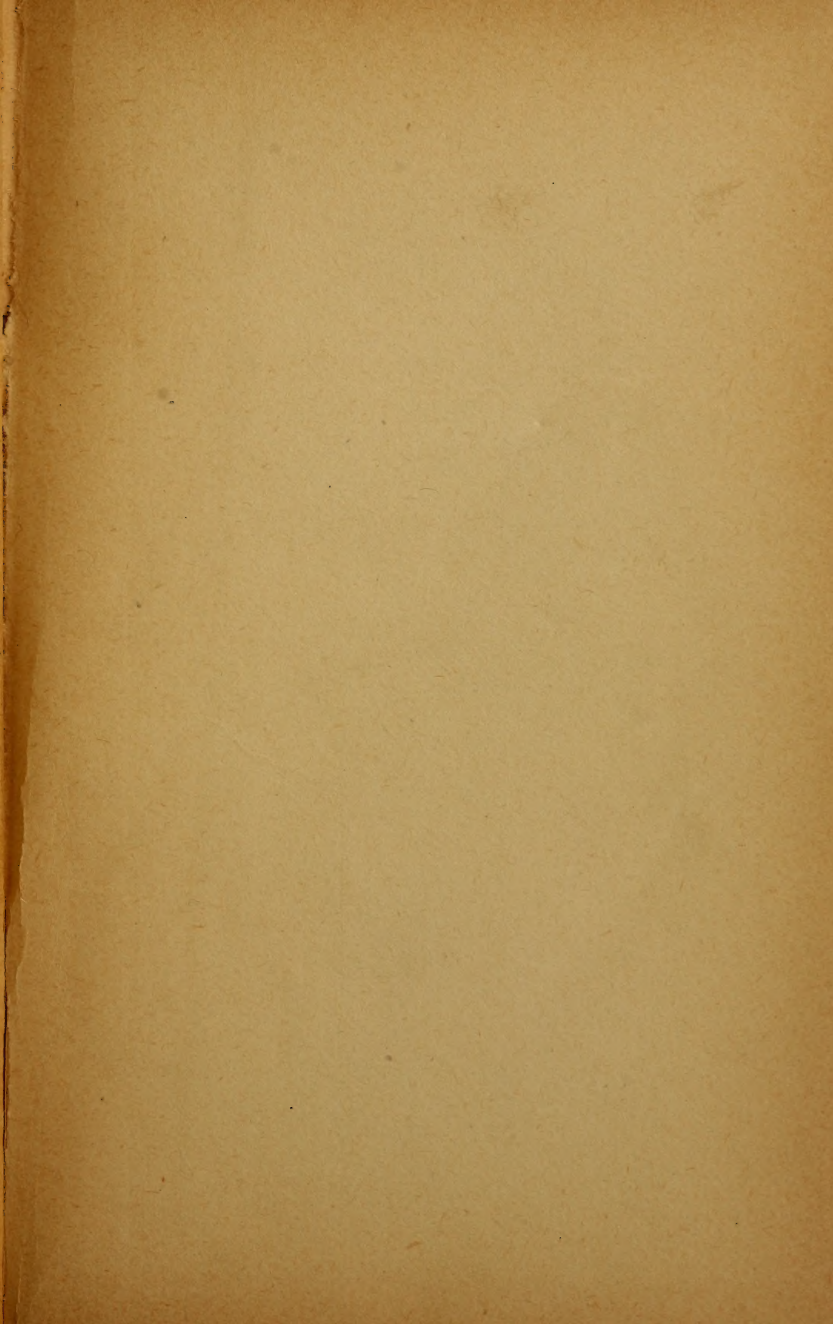
UNITED STATES OF AMERICA.













# LAMENESS OF HORSES

—AND—

## DISEASES OF THE LOCOMOTORY APPARATUS

BY

*refunder*  
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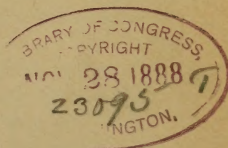
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## PREFACE.

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The material which forms the substance of the present volume has been for some time in a state of preparation, but its final arrangement in a suitable form for presentation to the public has been delayed by reason of the author's hesitation in determining affirmatively and definitely the question of the need and the demand, in veterinary circles, for such a work. But a careful consideration of the subject, with a full and appreciative knowledge of the scope and character of the authorities, to be found in our English veterinary literature, in the same range of subjects, has satisfied him that a new collation of accumulated facts and established views, supplemented by such original suggestions as have appeared to him to be pertinent and important, brought together in an orderly arrangement and a compact form, in a single volume, moderate in bulk and easy of reference, could scarcely fail to find at once a place, a use and a welcome.

With the exception of the ever admirable work which we possess in the two volumes of Percivall, there has been of late but little added to the literature of the lameness of the horse. Gamgee confines himself mostly to the subject of shoeing, and other contemporary writers have quite failed to assign a commensurate place to so important a branch of veterinary science as the pathology of the locomotive organs of the horse.

The author has therefore judged that though a further consideration of the subject may not be necessary in order to supply an absolute "felt need;" and though the present work may not startle the reader with the announcement of surprising discoveries of fact and remarkable novelties of theory; yet as a contribution of comparatively recent discoveries and a help to a further practical discussion of an important topic, it would none the less find a place on the shelves and in the regards of the

advanced veterinarian, and demonstrate its own value among other permanent records of experience and opinion.

In addition to his own notes of practice, his reminiscences of a large experience, and many years of careful and close observation, he has drawn freely for his material upon contemporary English and continental authorities. The reader will therefore be quite apt to become moderately familiar with the names of Percivall, Williams, Bouley, Zundel, and others—all of them good men to know, however, with valuable information to communicate to the reader, to practitioners and to students.

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We tender our acknowledgements to DR. D. G. DIXON, (D.V.S.) for the care and patience he has devoted to the correction of the first proofs of the work, and to Dr. H. D. HOLT, (M.D.) of Jersey City, for his aid in the review and revision of the rough notes of the original manuscript.

We submit our work with a cherished assurance of a kind reception and friendly judgment from our readers, and with the hope that it may not fail to accomplish the purpose which has been our motive in its preparation, by contributing to  
THE IMPROVEMENT OF AMERICAN VETERINARY LITERATURE.

THE AUTHOR.



# LAMENESS OF HORSES

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## CHAPTER I.

### DESCRIPTIVE DEFINITION—SYNONYM—ITS IMPORTANCE.

A comprehensive definition of Lameness (or Claudication) would describe it as an irregularity or defect in the function of locomotion, affecting either a single one or several of the extremities, and proceeding variously, from congenital imperfection, from disease, or from external, accidental causes, such as wounds, or other temporary and occasional casualties.

The general condition involves the inability of the patient, greater or less according to the degree of the ailment, to sustain weights, as in fractures or dislocations of the bones; a loss of muscular power as in atrophy or paralysis; the effect of pain consequent on disease or injury, such as special lesions of the muscular and nervous structures, including punctured or other wounds of the extremities, or the imbedding of stones or other

hard substances in the foot, and "picking up" nails. Or, as occasionally occurs, it may be referred to an inequality, congenital or otherwise, in the length of the limbs, even when due to an accident not more serious than the loss of a shoe.

Lameness is therefore, not so much an original evil, or disease *per se*, as it is a symptom and manifestation of some antecedent vital physical lesion, either isolated or complicated, affecting one or several parts of the locomotive apparatus.

In estimating the importance of this subject we have but to consider that the value of the horse to his human owner must be measured wholly by his ability to exercise his powers as an agent of transportation, in the traction of burdens, and in bearing his master's person in travel or for pleasure. It becomes then at once apparent that his capacity for usefulness consists wholly in the condition, as to efficiency, of his apparatus of locomotion, and his power and will to use it. The idea of a good horse with poor legs is a misnomer; the legs are the essence of the horse, and every other part of the equine machine is of only subservient and tributary importance.

The treatment of lameness necessarily, therefore, occupies a large portion of the field of veterinary surgery, not only on account of the economic reasons

which urge the prompt restoration of a disabled servant to his working capacity, but as well, also, because of the frequent difficulties of diagnosis, and the not uncommon occurrence of cases which persist in proving refractory to treatment.

### VARIETIES OF LAMENESS.

In Bouley's classification of the varieties of lameness, he defines six species, having respect severally to (*first*) the organ or tissue of the lesion of which it is a symptom; (*second*) the region or locality involved; (*third*) the duration of the case; (*fourth*) its peculiar type; (*fifth*) the degree of severity; and (*sixth*) the special nature of the attack.

A tabulated arrangement of this classification would assume the form following :

- 1.—*Organs or Tissue, and how affected*.—Muscular lesions; rupture of tendons; luxations; sprains; exostosis; thickening of tendons; neuroma; neuritis; synovial dilatation: corns; punctured wounds etc., etc.
- 2.—*Region*.—Foot; shoulder; hip; stifle; fetlock lameness, etc.
- 3.—*Duration*.—Recent or acute; chronic.
- 4.—*Type*.—Continued; warm intermittent or cold intermittent.
- 5.—*Degree*.—Soreness of the animal; lameness; lameness on three legs.
- 6.—*Special nature*.—*Essential*: sprains, luxations, bruises, etc.  
*Symptomatic*: of farcy, of glanders, of hepatitis, of pneumonia, etc.



## ETIOLOGY.

The causes of lameness can be best considered by comprehending them under the two general terms of predisposing and occasional.

It would be useless to attempt the enumeration of all of them in detail.

The predisposing causes may be divided into the following six varieties :

(1) *The Condition of the Extremity*.—The limb may exhibit a lack of power, simply from a defect in the sources of energy, inherent and undiscoverable, or there may be an irregularity in the conformation of the parts and in the method of standing. In some of these instances there may be a deficiency in the size of the bones, which may be relatively weak in respect to the weight and bulk of the body they are required to sustain. This fact may also constitute the solution of the phenomenon in the case of those animals whose symmetry of motion and ease of posture are marred by sprung knees or knuckled fetlocks, or whose hoofs are badly shaped and who travel awkwardly on weak and deformed feet.

(2.) *The Kind of Work*.—Peculiarities attending the service exacted from an animal, and the consequent excessive and partial strain which may fall to the share of certain muscles are prominent among

the producing causes of lameness. Thus the hunter will be subjected to injurious strains arising from his violent efforts in leaping fences and ditches, and bruises and shocks from the more or less frequent falls which he is liable to encounter. The heavy draught horse must also incur frequent hurts from the oscillation of overladen wagons or trucks over rough and irregular roadways as he is jerked and shaken by passage over ruts and cavities, or strained by his desperate exertions in the extrication of a mired vehicle. And every one must be aware that the violence and the excitements of the life of a "high mettled racer" curtails the longevity of the abused creature to a few brief and exhausting seasons, and limits his existence and his glory to some poor half dozen years of spasmodic struggle and wearing effort.

(3.) *Conditions of the Roads.*—This element of the case, partially referred to under the preceding head, has a close connection with our subject, forming perhaps the chief factor in the estimate of the accidental and dramatic varieties of lameness. The nature of the surface upon which his hoofs must constantly and forcibly impinge cannot certainly be less contributive than other causes to the condition for better or for worse of a horse's feet and legs. This finds ample illustration in the excessive pre-

valence of lameness among the private road-horses so frequently "speeded" over the hard city pavements, as well as among the laboring beasts which haul the inhumanly loaded trucks and carts over the rough and worn cobble-stone and other wretchedly contrived pavements of some of our cities. It is not difficult, in view of facts like these, to explain why the country horse, is in so much better condition in respect to his legs and feet than the city-worked animals, often even dispensing without risk, with the shoe of his city relation.

(4.) *Immaturity of Age.*—When an undeveloped colt, whose stamina is not yet established and constitution not yet confirmed, with tendons and ligaments relatively tender and weak, and bones scarcely out of the gristle, is unwisely condemned to hard labor, it is irrational to expect any other results than lesions of one or another portion of the abused apparatus of locomotion. They will be fortunate if they escape a fate still worse, and become sufferers from nothing worse than mere lameness.

(5.) *Shoeing.*—Setting aside the traumatism to which the feet of the horse are exposed in the act of shoeing, as sometimes illustrated by the result of a burnt sole or puncture by a nail, there are still other conditions related to it, which it is proper to consider while examining into the causes of lame-

ness. If they are carefully sought for, the culprit trouble will often be detected under the foot. At one time a shoe making uneven pressure on one part of the foot will reveal the truth of the matter. In another case the shoe will have been suffered to remain too long on the hoof; and again, the uneven paring of the foot by a careless farrier may sometimes be discovered only through the mischief it has wrought.

(6.) *Heredity*.—The recorded instances of the transmission of diseased conditions capable of producing lameness by each of the parent animals in its own line are too numerous to allow the facts to be ignored, establishing as they do, the law of heredity in the matter, quite beyond the reach of contradiction. The development of ring-bones and of spavins, of navicular disease, and of enlarged synovial bursæ, etc., in animals which had never been subjected to labor, is a circumstance too familiar to intelligent stock breeders to need proof. It is from the teaching of experience that it has become a point with them, while managing their breeding business to guard carefully against the perpetuation of bad blood in the stock they raise.

As to the occasional causes of lameness, as we have intimated, they are practically, too numerous for specification. They comprehend every descrip-



tion of external violence upon any part of the extremities, by whatever agency inflicted, (some of them already mentioned), whether kicks, blows, bruises; injuries to the feet by stones or nails; the burning of the sole by applying a shoe too hot, while fitting it to the foot; sprains; injuries to the bones, and others practically innumerable. All these may become contributing agencies, and will be referred to in due order as we proceed to consider in detail each variety of lameness separately.

#### SYMPTOMATOLOGY AND DIAGNOSIS.

The diagnosis of lameness involves three points of inquiry, to wit: (*first*) the identification of the lame leg; (*second*) the seat, and (*third*) the nature of the lameness.

(1.) *The Designation of the Diseased Limb.*—To determine this point the animal must be examined under three conditions, viz., while at rest; while in motion, and while resting immediately after being exercised.

*While at rest*, the leg will be held in such a position as to relieve it from the weight of the body, and will be favored in proportion to the severity of the pain caused by putting it to use. The fore leg will be carried forward, in the position of "pointing," the leg being sometimes extended or half

flexed, either at the knee or the fetlock joint. At other times it will be held up, or suspended, or hanging down with the anterior face of the foot resting on the ground.

When the hind leg is affected, it is either partly flexed and resting on the toe, or held up in abduction or again partially or wholly held clear of the ground. At times, again, it may droop, the femur and tibia assuming a vertical direction, with the metatarsus extended on the hock, the limb resting on the anterior face of the wall and the phalanges.

Of course, while a diseased limb withholds its support from the body, the remaining three must sustain the entire weight, and a change in the centre of gravity necessarily results.

When two legs, either both of the fore or both of the hinder, are simultaneously afflicted, relief will be sought by resting the foot or leg of each side alternately, giving the longer period of relief to the tenderer limb if there is a difference, and by seeking by an instinctive movement so to change the centre of gravity as to cause the greater weight of the body to bear upon the sound extremities. As far as this can be accomplished, when the fore legs are the sufferers, it is effected by bringing the hinder limbs as far as possible forward under the body, and

elevating or throwing back the head ; or, when the infirmity is in the hinder parts, by setting the fore legs back under the body and extending the head forwards. The philosophy of these changes of posture is obvious.

When the pain producing the lameness is severe and acute, and there are sharp and lancinating pangs the fact will be shown, together with the movements already described, by a continuous motion of the legs, consisting of a swinging to and fro, or moving up and down, of the suffering member. The condition of the bedding, or even that of the shoe, should then be taken into account in the examination of the patient.

The best time for examining a lame horse, is *while he is in action*. An attendant should lead him on a trot, preferably on hard ground, in a straight line, allowing him full freedom of his head, so that his movements may all be natural and unconstrained. The observations of the surgeon should be made from various points. He should place himself in front, on the sides, and behind the animal, and carefully study the action of the limbs from each point. The mere act of walking is often insufficient to reveal the lameness satisfactorily, and the gallop is a most unfavorable gait, errors easily occurring while watching a patient undergoing that form of

exercise. At times, discoveries may be best made by watching the horse when moved in a circle, being careful to reverse the direction, in order to compare the effect on either side, as the direction is changed. It is well to note the effect of the act of turning, when the suspected leg becomes a pivot for the movement. The point of lesion will sometimes in this way betray itself, when an ordinary direct forward movement would fail to reveal it. It is sometimes advantageous to cause the patient to travel on a inclined plane, especially when the lameness is located in the anterior legs, by way of exaggerating the pain by the overbalance of the frame, and thus intensifying its manifestation. In some instances the trial should be made on soft ground, rather than on a hard road, in order to increase the necessity of muscular effort necessary for making way over that more difficult species of surface.

The animal should always be unblanketed during an examination, and have nothing about him likely to interfere with the spontaneous movements and the unobstructed view of all parts of the body. The inspection of an animal while mounted and ridden is unreliable, and often misleading in its results.

Many veterinarians examine their patients while they are kept under the restraint of a bridle. We prefer to have the animal held with a single halter,



the attendant holding him on the left side, while keeping his right hand about one foot from the horse's head.

The natural instinctive tendency of the suffering animal which will always prompt him to relieve the affected leg, will also always indicate the side on which the lameness exists, and a little watchfulness will always detect the effort of the patient to spare the weakened member from its equal duty, at the expense of its partner. In favoring the weak limb, it will be set on the ground more slowly and hesitatingly, and raised from it more quickly, and with a shorter forward movement than the other, and the percussion and pressure in setting it down will be modified by the apprehensions of the patient according to his experience of the pain it has before cost him to do so. Just the contrary will occur on the sound side. The foot will be planted more promptly on the ground and held there longer and more firmly, and with a steadier motion when it is raised again and thrown forward, while the weight of the body also will be thrown more unhesitatingly and heavily on the ground, from the yielding of the weakened side and its partial failure to assume its burden more promptly.

When the fore leg is the lame one the movements of the foot and head occur somewhat in unison.

When the lame foot is raised, the head is elevated, but only to fall when the sound leg is brought to a rest.

If it is a hind leg which is the seat of trouble, the haunch settles downward when the sound leg touches the ground; while at the same time the head is brought down when the diseased member is brought to a rest. In other words, *the animal throws the weight of his body upon the sound leg.* These oscillations (or nodding) of the head and of the haunches are of great importance as points of observation, inasmuch as they simplify the solution of the problem; *if the animal drops to the right side the lameness is on the left, and vice versa.*

This irregularity, or rather counterpoise of action is not only revealed to the eyes, but may easily be discerned by the sense of hearing, by reason of the greater resonance of the percussion of the sound foot as it strikes the ground—the lame foot being put down carefully and comparatively noiselessly. Professor Sewell, of London, and Professor Dick were quite familiar with this element of diagnosis, and Percivall remarks that: “It is, therefore, possible  
“ for a blind man—and more possible, from the well  
“ known acuteness of his faculties, for him, than for  
“ a man who blinds or excludes himself from view of  
“ the same horse—to say of what leg a horse goes

“lame, and afterwards to ascertain with the best of judgment the seat and nature of the lameness.”

An animal may become lame in two of his limbs in several ways. Both of the anterior extremities may be affected, (the *anterior biped*) or both posterior (the *posterior biped*); or one anterior and one posterior on the same side, (the *lateral biped*); or one posterior and one anterior on opposite side, (the *diagonal biped*). The first and second varieties may be observed in cases of laminitis or of navicular diseases, and will be considered in another place. The lateral and diagonal biped forms are characterized by the united symptoms of the anterior and the posterior bipeds, but are much more developed by reason of the increased difficulty of locomotion.

The diagnosis may be much aided by an examination of the animal after he has undergone exercise. One which, while at rest and cool, stood firmly and squarely on his feet, may just after working point or rest his hind leg in a semi-flexed position, or in that of abduction.

(2) *Determination of the seat of disease.* — This important and frequently difficult problem involves a large amount of consideration and the exercise of much tact on the part of the surgeon. One rule should be observed with strictness. The judgment of the surgeon, though in many instance he may

obtain much assistance from the history of the case, must never wholly rely upon such a source for the data of a final and reliable verdict. His reliance must be the significance *per se* of symptoms such as we have described and such other signs and manifestations as his acumen and experience may enable him to discover. He cannot dispense with the study of the attitudes of the animal both at rest and during the act of locomotion, and the appearances during and subsequent to his exercise, nor reach a justifiable conclusion while overlooking the objective symptoms to be learned from a study of the implicated limb or limbs.

In availing himself of the facts comprised in the history of the case, the essential points upon which he will rely for the assistance of his judgment will refer to the duration of the lameness from its first appearance; whether its occurrence was coincident with any accident, such as a blow or a fall; whether it followed a recent shoeing, and what had been its prevailing type, whether continued or periodical, warm or cold, or whatever else an intelligent and interested observer may have noticed. It may sometimes happen that some apparently insignificant or trifling item may furnish a key which will at once unlock the truth.

The posture of the animal while standing is a point



of great importance in its relation to the seat of the lameness. When, while "pointing," the animal rests his foot flat and firmly on the ground, it is evident that the ailment is not in that part of the leg, while knuckling at the fetlock will be suggestive of lesions at that joint or in the phalangeal region. Lesions of the stifle joint will also be indicated by the excessive extension of the hind leg backwards, with inability to perform the act of flexion. The presence of lancinating pains is often characteristic of suppuration within the horny walls.

In inspecting the action of the animal for the identification of the lame member, very close attention to minutiae is necessary in order to discover at what point in the implicated limb the injury is located. As far as relates to the movements of various parts of the limb, while the leg may be carried in the manner before indicated, there will at the same time be something in the manner in which it is displaced, which will enable the surgeon to determine whether the cause lies in the upper or lower part of the extremity. In hurts of the upper regions of the limb the action will have less freedom and latitude than when the foot or the lower region is the seat of trouble. This greater or less latitude of motion will be understood by the experienced surgeon to be an important feature of the case. In

dislocation of the patella the leg is extended violently backward, with an entire disability of flexion. Paralysis of the anterior femoral nerve, so frequently noticed among the sequelæ of azoturia, and the peculiar appearance of the limb which has suffered from rupture of the flexor metatarsi, are also phenomena which must be studied during the movement of the patient, and are frequently sufficient by themselves to furnish the materials of a correct diagnosis.

Fortunately, besides those already mentioned, there are other means lying nearly or quite in the line of direct exploration, in the study of what may be denominated the objective symptoms, which in a majority of cases are, to the expert, a positive value by obviating any doubtful resort to surmise or hypothesis, and which may fully preserve him from the danger of making uncertain or erroneous decisions. A direct examination of this nature will often reveal the existence of positive symptoms by which the diagnosis will be at once transferred from the region of doubt to that of satisfying certainty. In one case it will be a ring bone ; in another a thickened tendon ; or a change in the direction of one of the bony levers ; or a deformity of the foot ; or an excess of action, or again, inability to act ; and so on almost indefinitely.

The examination of a horse's leg for the discovery

of the reason of his lameness can never be conducted with success, in any obscure case, without very close and careful attention to every detail and a full understanding of all the possibilities of the case. It is often only by the most thorough examination of the entire affected region, from the upper to the lower parts of the leg that the changes of form, of consistency, of size, of sensibility, of temperature, or whatever else may be the factors of the case, can be detected. The amount of pain betrayed upon pressure at a given point, or by the various movements to which the limb may be subjected; the difference in size as ascertained by measurement; the increase or diminution of the natural heat, as indicative of an accelerated or retarded circulation; the pulsations of an artery in its passage over some given part of the leg—these are all to be numbered among the signs which in many cases become positive and symptomatic in assigning the location of the disease which finds its expression in the lameness.

Independently of all these specifications, there is one point in the examination which must *never be overlooked*. The old adage, "if your horse is lame in the shoulder, take off his shoes," must have had experience for its parent, and derived its origin from a true knowledge of the importance of the careful examination of the implicated member.

Besides the fact that it is principally in the foot, especially the fore foot, that the cause of lameness is found to be lodged, and that to this the lameness of the entire corresponding limb is most commonly due, there is the fact, not to be overlooked, that lesions of that member are in many cases of comparatively easy concealment, and moreover, that the lesions likely to occur as the result of the traumatism of that member are often quite apt to assume a serious character, if not to end fatally.

Young and inexperienced practitioners are quite too apt to commit the error of overlooking the examination of the foot, looking upon it as a matter of secondary importance, and attending to it as a routine and formal affair only. It is a dangerous habit and may easily become an expensive error both to patient and practitioner.

The veterinarian should attend personally to the examination of the foot. Every step of the process should be supervised, including the removal of the shoe, the paring of the hoof, if necessary, the exploration with the nippers, the percussing of the hammer, the inspection of the nails as they are drawn out; and in short, every step of the blacksmith's work should be watched and noted, and the appearances and symptoms carefully weighed. He should never be influenced by the circumstance of a



previous examination by a horse shoer, either to omit or to relax his through scrutiny of the case entrusted to him. It may be at times true that at a first examination no notable facts had been detected: the most minute search may have failed to expose any appearances which would justify the location of the trouble in the foot, and the same remark might be truthfully made in respect to the leg. Still, the crippled action may be of a kind characteristic of injury in the lower part of the limb. It is in this state of things that the examination of the foot is of special importance. The failure of the first attempt must not satisfy the surgeon as to the soundness of that region. A second, or even a third exploration should be made before a satisfactory conclusion can be reached.

It cannot be denied that there are cases in practice in which the most careful exploration results in essential failure. In these elusive instances resort must be had to the rational process, and the method of exclusion must be practiced. A satisfactory conclusion will usually be the result with intelligent and experienced practitioners.

(3.) *The Nature of the Lameness.*—The detection of the seat of lameness and the determination of its special characteristics are steps so nearly related that when the knowledge of one has been acquired

the discovery of the other cannot be far off. For example, when upon examination of the patient the seat of the lameness is found to be in the foot, at the bars, or at the sides of the tendons, or of the metacarpal bones, or behind and above the knee, or the internal face of the hock, or at the stifle, etc. etc. the suggestion immediately follows that the cause will prove to be a corn, or a sprain, or a splint, or a carpal hydrarthrosis, or a spavin, or a hygroma of the stifle, etc. His result is the fruit of the experience of the fact that the diseases named are usually found in the regions designated, and that moreover, it is from the special symptoms of the ailment more or less defined, that the location of their seat has been determined, and thus the two ideas of region and nature have become so intimately associated that they can no longer be isolated in the mind of the trained expert.

Then, the seat of disease being known, the suggestion of its nature at once follows, and reciprocally, when the nature of it has been discovered the seat of it becomes likewise known. Most commonly the determination of the nature of the diseases results from the study of the rational and objective symptoms of the part which is its seat. It is the most certain method of reaching a correct diagnosis, and should always be observed, if practicable. But

in the absence of the objective signs, and when the surgeon has only the interpretation of the rational symptoms to aid his judgment, he can only succeed in fixing the seat of the disease by a consideration, of the nature of its cause through the mode by which its effects are manifested. For example, though the lameness caused by the obliteration of principal arteries of a leg is attended by no well marked material symptoms which demonstrate the lesion of the deeply seated vessels, concealed under the muscular masses, yet the series of the phenomena exhibited will enable the observer to conceive with certainty the true nature of the lesion, as well as positively to fix the seat of the trouble.

This method of proceeding is not followed by results of such absolute certainty as belong to the first, and it is also attended with greater difficulties of application, involving a laborious process of deduction and through acquaintance with the apparatus and physiology of locomotion. Still it also leads to valuable and important results, the more interesting from the partial absence and the imperfection of the elements of positive diagnosis. It is to this that the progress achieved by the science of veterinary prognosis in recent years is due, and that the veterinary surgeon of the present time is so well able to define and discriminate among the spe-

cific characters and peculiar features (as for example cases like those of navicular disease, rupture of the flexor metatarsi, loss of power due to embolism, etc.) pertaining to the hitherto obscure subject of the general ailment of lameness.

### TREATMENT.

The causes of lameness are so numerous and the diseases and accidents of which its different forms are the manifestations and effects are so varied that it would be an impossibility to establish absolute rules for their general treatment, and as the corresponding therapeutic means must necessarily be easy, according to each case as it presents itself, the study of the subject, in this direction, must be assigned to subsequent chapters, anticipating the subject somewhat, however, by some remarks in this place which will not be untimely or irrelevant, whenever uttered, upon a point of practice which must never be overlooked.

We refer to that portion of the treatment of lameness which may perhaps sometimes be considered as rather belonging to the negative than to the positive features of the curative agencies, viz, *rest*, on time and inaction. If it is considered that by rest we refer to that period of time which elapses during the illness of a sick animal while he is sub-



jected to certain topical applications, such as lotions, fomentations, caustics, blisters, etc., our remarks would seem to be, and would indeed be, of a superfluous character. Though it is somewhat inverting the order of mention, we are but referring to that general supplemental inaction of the convalescent patient which is necessary for, the confirmation and establishment of the effect of all curative means. The rest we mean is that interval of quiet which experience and a knowledge of pathology has taught us to be necessary for securing the complete restoration of structure and consequent perfect (if possible) return, from diseased to healthy conditions a process of recuperation necessary in equal measure to both man and beast under like circumstances. It too often occurs that an animal whose misfortune it is to be controlled by a cruel and ignorant or avaricious owner, is returned to his work, after having been subjected to firing or blistering, almost before the removal of the visible marks of the treatment he has suffered, with the result, easily predicted, of the reappearance of the lameness, after a brief period of torture in the shafts or traces, when the whole of the trouble might have been avoided by allowing the debilitated convalescent a peaceful rest of three or four weeks, with judicious feeding and humane attention in other respects. Many a

horse which had become lame with articular disease, has been restored to perfect soundness, after the failure of every variety of external treatment, by simple rustication in the country where he has been fortunate enough to be permitted to "have a good time" on the soft ground, and exemption from work. We refer to this *long rest*, as an item in the general treatment of all lameness, as a point of great importance, and while we do not wish to convey the impression that we consider it to be the only mode of treatment applicable to all forms of disease capable of producing irregularity of locomotion, we believe that in a great proportion of cases the failure which has followed a proper and well applied treatment for the restoration of lame animals is simply due to the fact that sufficient rest has not been allowed to the animal for the local treatment to produce its effects, or for pathological lesions to undergo the necessary alterative action to secure the re-establishment of their lost former condition.

## CHAPTER II.\*

### GENERAL CONSIDERATIONS RELATING TO THE DISEASES OF THE VARIOUS ORGANS OF LOCOMOTION.

#### DISEASES OF BONES.

##### PERIOSTITIS—OSTITIS—OSTEOMYELITIS.

Under this title is to be understood the general subject of inflammation of the bones, under the various characters it assumes, having relation to the tissues more immediately affected, and including the bony substance proper, the investing membrane, or periosteum, and the enclosed medullary substance, or marrow. We have, therefore, to consider three ailments according to the tissue specially implicated to wit, osteitis proper; periostitis, and osteomyelitis. The three affections exist in intimate relationship, originate in the same causes, and are usually inseparable in the living animal, and amenable to the same course of treatment.

*Causes.*—The development of osteitis is usually attributable to the operation of local causes, among

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\* This chapter will include the consideration of such affections only as are directly connected with the leading subject of this work, i. e., *Lameness*.

which may be specified bruises, wounds, fractures, long continued pressure, contact with foreign bodies, caustics, etc., and to these may be added inflammation of tissues surrounding the bones, of joints, and ligaments, of tendons, of the sequelæ of fractures, amputations or trepaning. Its usual appearance may be looked for in bones which are situated superficially, owing to their greater exposure to external dangers. There are still other causes of a general character, of which an abnormal condition of nutrition, giving rise in the immature animal to rachitis, and in the mature to osteomalacia is one. Farcy, glanders, rheumatism, tuberculosis and actinomycosis also, belong to the category of general and constitutional causes of ostitis. And it cannot be doubted that the frequency of osteoporosis in America has brought the veterinarians of the United States into familiar acquaintance with the ostitis of horses affected with that disease.

To repeat: ostitis may proceed from both internal and external causes, and may affect either the periosteum, the bony tissue proper, or marrow, according to peculiarities of the case.

*Symptoms.*—The characteristic pain of ostitis is usually dull and continuous, seated at times on the surface, and at times in the depth of the structure, and it always gives rise to lameness. The region



corresponding to the seat of the attack participates in the disease, and becomes swollen, with an increase of temperature, and at times pain. The swelling is due to an increase of size in the inflamed bone, caused by the accelerated periosteal secretion, or the tumefaction of the soft tissue surrounding, the periosteum itself, the cellular tissue, etc. When the surface of the bone is the seat of disease, the soreness, may be detected by pressure and the local increase of temperature will become palpable to the educated touch of the expert.

*Progress and Termination.*—The progress of osteitis is seldom a rapid one. As a rule, the disease is slow in its course, and of a lengthened duration. Like others of the phlegmasia, it may have its termination in resolution, or may settle into the chronic form, with its accompanying phenomena of alterations of the bony structure, as in osteitis deformans, and fragilitis osseum ; or, finally, in suppuration, in caries, in gangrene or necrosis.

*Prognosis.*—The disease is always grave and serious in its aspect and effects, owing not only to the slowness of its progress and its tendency to frequent relapses, but to the more or less extensive suppuration which may accompany it, and the serious blemishes by which it may be followed.

*Treatment.*—When the attack is due to local causes,

good results may be expected from the antiphlogistic treatment, with cooling applications and anodynes. The most satisfactory course, however, will be the counter irritant, principally by blistering. As the disease progresses, with a tendency to become chronic, a resort to alteratives will be indicated, with a preference for the iodine and mercurial preparations. But when it has reached the chronic stage reliance can be placed on the actual cautery alone.

### EXOSTOSIS.

Among the diseases of the osseous structure which afflict our domestic animals, especially the horse, there is none more frequently encountered, or which more frequently baffles the skill of the veterinarian, as this form of bony redundancy. Its study therefore becomes, from a practical point of view, of paramount importance. Having its seat usually in close proximity to some one of the articulations, these exosseous projections become a sure cause of lameness, which as well as always resulting in a blemish of the appearance of the animal interfere with its powers of usefulness, by causing a partial if not an utter inability to labor, and a consequent deterioration if not a total loss of pecuniary value. On this account the question of location becomes an

item of prime importance in the study of the case. And to facilitate our knowledge of the subject, it may not be amiss to recall the various terms used in old hippiatry for the designation of the different regions of the body where the disorder resides. Thus we have spavins, splints, ring bones, side bones, etc., according as the various exostoses appear at the hock, in the metacarpal, metatarsal or phalangeal, or even the digital region.

*Symptoms.*—In its ordinary form, an exostosis is accompanied by pain, more or less marked in its degree, with an elevation of temperature in the part affected. The pain is easily evidenced by the struggles of the patient to escape the manipulations of the surgeon while conducting his examination. The activity of the vital processes in the bone being less than of the softer structures, the phenomena of inflammation are correspondingly less manifest than in other tissues, the inflammation is more tardy in the entirety of its progress, and it thus requires more time to reach the acute stage and it is therefore more likely than in other cases to assume the chronic character. When a bone of one of the extremities is affected, the lameness will supervene, during the first stage of the inflammation, irrespective of the precise situation of the abnormal growth. This is perhaps accounted for by the pre-

sence of the inflammatory process in the periosteum. This being an inelastic and unexpansive membrane, the pressure of the tumefied parts, as with other fibrous structures becomes excessive upon the nervous tissue, and as there is no yielding, as with the softer parts, for the relief of the irritated nerves, the case becomes one of exquisite suffering. This pain is continuous, during the growth of the exostosis, and usually ceases only when the tumor has ceased to enlarge, but subsequently, the surrounding tissues being more or less irritated by its presence, its evolution is again started, and a further increase of size takes place. Intermediately, between these two periods the pain usually subsides, returning again however with the renewal of the growth of the tumor. With the full development of the tumor, there should be cessation of pain, except under such special conditions as excessive labor, or the interference of the tumor with the movement of a joint or tendon, in which case the lameness and pain are no longer caused by the pathological condition of the exostosis, but by the obstruction of the mechanical act, and nothing more.

A deeply seated exostosis, when covered by the soft parts, unless giving rise to visible phenomena, may not necessarily be detected. But when it interferes with the action of a muscle or ligament, or



the course of the blood vessels, or the action of a nerve, or a joint, the result may then be various forms of lameness, which may be aggravated or diminished by exercise.

Exostoses vary in form, size, number and situation. They may vary from a sharp to a blunt projection, more or less developed, or their surface may be rounded, smooth, or irregular; or they may represent styloid eminences, more or less elongated; or they may form a large mass, sustained by a pedicle. They vary greatly in size, from very small to very large. At one time they will appear upon a bone singly, while at another, a number will be distributed along the length of a single bone. None of the bones are exempt from their presence, but they are principally found, in hard working animals at the extremities of the long bones, and around the articulations.

*Progress and Termination.*—One of their characteristics is slowness of growth. They require years to acquire their full dimensions, a fact well illustrated in cases of periostitis of the phalanges, were they cannot be recognized until an advanced stage of developement has been reached.

They rarely terminate by resolution, their prevailing habit being the maintenance of a fixed form under the appearance of a bony exuberance quite

inamenable to removal by operative methods, but still subject occasionally to a resumption of growth and further enlargement in size.

*Pathological Anatomy.*—The varieties of the disease which most nearly concern us in our present discussion are the epiphysar, or periosteal, which are found usually between the bone and the periosteum and denominated by some writers, the *osteophyte*.

The developement of the epiphysar variety bears a close analogy to the normal growth of the bone, the periosteum being in both cases the secreting organ and carrying forward the formation process by the same methods in both cases. We have thus, first the deposit of a cartilaginous substance, with the characters at first of ordinary plastic exudation, succeeded by the deposite of the bony material proper, with a regular and progressive change from the plastic softness to osseous hardness, until the solid bone appears. The growth is at first detached from the bone, or connected only by a layer of soft material, easily detachable by maceration, but increasing in consistency and adhesive quality until the union between the two tissues is perfected. There is an areolar appearance in the newly formed exostosis, but with time this is lost, and with it, any supposable difference in the substance of the normal and the redundant mass.

*Diagnosis.*—The presence of this redundant mass is, naturally, not difficult of discovery and identification, especially when formed upon one of the superficial bones. This hard, resisting, fixed, uncompressible, adherent tumor, cannot be confounded with any other abnormality or lesion known to pathology or surgery.

*Prognosis.*—There can be little room for a favorable prognosis, in other than exceptional cases, in a disease which so nearly involves the loss of the very qualities which confer upon the affected animal his essential value. Its least injurious result is a serious blemish or deformity of the patient, while it may easily cripple its usefulness even to the extent of producing total disability to labor, and the consequent entire destruction of his value as a laboring agent. The difficulty and rarity of cures in exostosis are enhanced proportionately to the duration of the disease.

*Causes.*—Any of the causes of periosteal irritation may produce this lesion. Bruises, falls, blows, exertions, sprains of the ligaments, premature work, excessive fatigue, etc., may be enumerated. And these causes will prove all the more productive as they coincide with the youth of affected animal. Many cases of the disease may be attributed to the last named cause, especially as they include those—and

they form an important item of the category—of the young colts too early put in training for the exciting and excessive exertions of the racing tract. The effects of heredity are also credited with the développement of a proportionate share of cases.

*Treatment.*—The treatment we have most to consider must be of a local kind, inasmuch as the development of lameness is a local effect proceeding from local causes, as those of a physical and traumatic nature; and the result of the experience of observant practitioners confirms this theoretical view. The means most generally in use are varied. Sedative and emollient applications are often of very material benefit, and there can be no doubt that in the first stages of inflammation, and when the periostitis has been arrested, great advantage has resulted from the use of water, both warm and cold, with similar topical means. Stimulating frictions and the various forms of counter irritation are strongly recommended, and among these a prominent place is assigned to the ordinary cantharidal blister. Besides these methods, resort has been had to that of alteratives, with results highly satisfying. Much benefit has followed the use of iodine with its compounds and combinations, especially in the treatment of cases of recent origin. The more energetic compounds of mercury, as corrosive sublimate, are



of more questionable utility and more or less danger attends their use. The less violent effects of iodine and simple mercurial ointment are more to be desired. Unguents having the red iodide of mercury for a base are in general use for exostoses of recent formation. Other caustics have sometimes been recommended, but the severity of their effects tends to bring their use into disfavor.

A common resort in the treatment of exostosis is firing. Gourdon, Zundel and others recommend its application in straight lines. But, supported in our view by Bouley, Rey, Leblanc and others, we prefer the deep pointed method, in dots, introducing the iron through the skin, down to the periosteum, and even penetrating its structure. Needle firing, so called, or the penetrating deep cautherization, has given very satisfactory results; and an advantage is gained for it in the fact that the operation may be repeatedly performed without causing any material blemish or disfigurement.

The excision and ablation of exostosis has been recommended, and in cases occurring not in proximity to the joints, into which the tumor is likely to extend, it is perhaps the indicated treatment. But from our experience in cases where the bones of the extremities are the diseased organs, and possibly when the exostosis occur in connection with the

joints themselves, we do not feel justified in recommending the practice for general adoption.

An operation originating with Professor Sewell, of London, and probably not sufficiently practised by veterinarians, is credited with many good results. It is that of periostotomy, and consists in the division of the periosteum covering the exostosis, in order to stimulate the process of resolution and check the abnormal growth. The incision of the periosteum is made with the *periostome*, a narrow, curved, blunt bistoury, with a strong blade, sharpened on its convex side. In performing the operation, an incision is first made, with a bistoury-lancet or scissors *ad hoc*, sufficient to admit the periostome, which is then carefully introduced under the skin, through the entire extent of the diseased part, until it is brought into contact with the thickened periosteum, and drawn over its entire surface, resulting in the division of the membrane. The operation is not apparently, specially painful to the animal. If the case is one of long standing, a seton is passed under the skin, with a needle adapted to the purpose, and suffered to remain for several days. Sewell claimed that only a mild type of inflammation and a moderate degree of swelling followed the operation, which were readily subdued by cold water applications, with slight exercise, and that not more than from

ten to fifteen days exemption from labor would be required. On that point, our experience agrees with that of Reynal, and has taught us that a high degree of inflammation may be present, with a considerable increase of the lameness, as the immediate effect of the operation. It has, however, in some special cases, produced excellent results, and may be recommended for application in exostosis of the metacarpal and metatarsal regions.

## DISEASES OF JOINTS.

### ARTHRITIS.

The general name of arthritis comprehends "any disease whatever involving a joint, but more correctly confined to articular inflammation. It is also employed to designate inflammation of *all* the structures forming a joint, as distinguished from mere synovitis." This excellent definition which we borrow from the dictionary of Dr. R. Quam, serves our purpose precisely, by enabling us the more readily to select the points in the pathology of our subject which will best correspond with the design and scope of the present chapter.

The diseases of the joints necessarily occupy a large space in the field of veterinary study and practice. This is on account of their frequency

and the usually serious character of their lesions as they occur in all the domestic animals, but preeminently in the horse, by reason of the special nature of the services and employments exacted from him by his human master, and perhaps in some measure owing to the greater delicacy of his constitution combined with his more active vitality as compared with other members of the brute family.

Lesions of the ligaments of the articulations are not of uncommon occurrence. They will receive our attention in another portion of this work, when we reach the special subject of sprains. Lacerations of these fibrous structures are the result of violent efforts, and though in some instances by no means easy of detection, they are at times accompanied by inflammatory manifestations of easy discovery; but although they may form the initial point of the inflammation of the joints, this, most commonly, first exists in the more inner regions of the articulations themselves. It is in this mode that the true arthritis occurs.

*Symptoms.*—The first intimation of arthritis is pain, which rapidly increases in intensity and is soon followed by the other signs of inflammation, swelling and heat. This may be arrested or mitigated by refraining from the act of locomotion, or it may be relieved by so adjusting the attitude, while standing,



as to exempt the articular surfaces from the pressure to which they are naturally subject in the ordinary position. When the seat of the disease is a joint of one of the extremities, the position assumed by the affected region becomes quite characteristic.

The changes which occur in the external form of the articulation are clearly indicative of its diseased condition. It then becomes the seat of a very warm swelling, œdematous at its circumference, but tense in the centre, with more or less fluctuation, and having an increased prominence at the point where the synovial capsule is less protected, and not uncommonly, there is a symptomatic swelling, more or less developed, in the parts of the limb situated below the diseased joint. This condition of simple arthritis is caused by a hypersecretion of the synovial substance by which not only is the articulation distended to its utmost, but the bones themselves more or less separated from their anatomical connection. Some special forms of this disease are accompanied by certain physical signs common both to human and veterinary practice, though of less easy discovery in the latter. Among these is a peculiar sound of sensation, which may be discovered by moving the articular surfaces one upon the other. It is a peculiar soft crepitation, as if caused by clotted blood, or when of a rougher nature, by the friction of

bony surfaces over which the cartilage has been destroyed. It is a noticeably peculiar condition, and is more commonly noticed in aged animals than in those younger. It belongs to the category of physical signs, and we have found it of great assistance in the diagnosis of obscure cases of lameness where a suspicion existed of lesions of articulating surfaces. It may be sought for by exciting the manifestation of pain by pushing or striking together the bony extremities. While the difficulty and the uncertainty of the results pertaining to this procedure must be admitted, cases have not been wanting in which it has been adopted with advantage and success.

Arthritis may exist with or without penetrating wounds. In the latter case the inflammation may present some very serious aspects. The swelling of the part, at times, assumes enormous proportions, with great heat and excessive pain in the joint, and the progress of the suppurative process in that part is soon revealed by the appearance on the surface of a copious bloody synovial discharge. At this stage of the disease the influence of the morbid process upon the condition of the entire organism is made manifest by the appearance of unmistakable general symptoms. The anxious expression of the face, the nervous and hurried respiration, the loss of appetite,

the hard accelerated pulse, the elevation of temperature, and corresponding symptoms, all indicate the severity of the pain experienced by the suffering patient. Fearing to lie down, he maintains the standing posture as long as his ability continues, upon his three sound limbs, and when from pain and utter exhaustion he falls at last, he does not often rise again.

Complications may always be anticipated during an attack of arthritis. Laminitis, tendinous inflammations in the opposite leg, purulent infection; or even tetanic affections, may become the evil accompaniments of this peculiar lesion of articulations.

*Pathological Anatomy.*—In the inception of the disease, in arthritis, there is a simple hypercemia of the synovial membrane, with a change of color, a reddish tint, more or less marked, taking the place of the natural hue, the synovia itself becoming reddened and injected with blood. At a later period, the membrane wears a dark and more uniform appearance; the underlying cellular tissue becomes infiltrated; and an exudation of the plastic mass of false membranes, of a yellowish color appears on the surface of the serous membranes, or interposing between the bones. There is then an increased synovial secretion, much thickened in consistency, and the result is an established condition of chronic

hydrarthrosis. The cartilages enveloping the bones now assume a red color, which is confined, however, to the surface. These cartilages also become themselves the seat of ulceration and the articular surfaces become eroded, or disappear entirely from the bones which is their province to cover.

*Terminations.*—Arthritis not unfrequently terminates in resolution. This occurs when the inflammation has not been marked by features of undue severity, but in other cases, when the symptoms become more marked it may advance to the chronic form. But if the suppurative stage becomes established, the only result that can be anticipated is the peculiar lesion known as ankylosis. The chronic variety usually follows the non-traumatic type, and consists generally of the condition known as hydrarthrosis, which may, however, arise from other causes.

*Prognosis.*—This is always serious according to the stage of the disease and its apparent force and persistency.

*Etiology.*—The causes are various. Besides those of a true traumatic character, such as wounds, or lacerations of the tissues covering the joints, of whatever nature, the disease may be principally referred to violent contusions, bruises, violent efforts of locomotion, and excessive labor. Arthritis is often one of the sequelæ of other diseases, or it may follow



sympathetically the lesions of the serous membranes. It is noticed as following mammitis, metro-peritonitis, pleurisy, pneumonia and pericarditis. In these latter instances, the rheumatic form supervenes, making its appearance in various parts of the body, but principally in the extremities.

*Treatment.*—In the management of arthritis, two principal indications must be fulfilled. The mobility of the joint must be controlled, and the inflammation must be prevented, if possible, from reaching the suppurative stage. The realization of the first condition is not always a task of easy accomplishment, in veterinary practice, but still, by sufficient and skillfull bandaging and other artificial appliances, the movements of the animal, if not wholly prevented, may be reduced to the minimum. In combating the inflammation, resort must be had to cooling applications, and among these, the ice bag should probably have the preference. Nothing, however, produces better results than constant irrigation. Strong liniments and vesicating topical lotions are very essential, aiding materially, by their counter-irritant effects, in overcoming the inflammation and preventing, or reducing the synovial secretion. The use of anodyne and sedative remedies find their indication before blistering, when the inflammation is high and the suffering extreme. Warm baths and fomenta-

tions, as decoction of poppy heads, and camphorated ointments, combined with extract of belladonna, are also recommended. Mercurial frictions are stated to have been applied with advantage. When the disease has gained the suppurative stage, the indication is to facilitate the escape of the pus by free opening and incisions. According to some authors, better results will be obtained by antiseptic aspirations. Added to this should be the free use of antiseptic dressings, with phenic acid, permanganate of potash, alcoholized water, or the tinctures of aloes, myrrh, or even of iodine—all have been recommended. The Egytiacum ointment is advocated as being of special efficacy, and even the actual cautery is commended as one of the most useful and effectual derivative means.

## SYNOVITIS.

This is the title by which the inflammation of the synovial membrane is recognized. It is a condition frequently encountered, and sustains an intimate connection with the inflammation of the joints, or arthritis. It is to the excessive vital activity exercised by these peculiar membranes that their greater liability to inflammation than other surfaces is to be attributed—a liability which must be greatly enhanced by the special character of their physiological functions.

*Articular Synovitis* is one of the lesions of arthritis, but though arising from the same causes is *per se* a less serious affection, and passes readily to the chronic state. It is then that it constitutes the condition known as hydrarthrosis.

*Tendinous Synovitis*, is a member of the same family, and when the sheath which is its seat, is in near proximity to an articulation, it becomes a somewhat doubtful diagnosis as to its true nature. These two varieties of lesions are both of them possessed of the same pathological characters, present the same phenomena, and are amenable to the same treatment.

#### HYDRARTHROSIS.

This is a true articular dropsy, constituted by serous effusion in the articular cavities. The disease is identical with that which appears in the formation of tendinous synovial sacs, the two forms being sometimes considered together, though Peuch and Toussaint make a distinction between them.

They may be observed in all animals, but occur with greater frequency in horses, and especially in those of a lymphatic temperament. All the joints of the body are liable to their invasion, but they may be most commonly looked for in those of the extremities, and principally in the articulations throughout

the digital region, i. e. the knee, the fetlock and the foot.

*Symptoms.*—It is manifested by the appearance of a tumor, situated over or near a joint, corresponding in form with the outlines of the synovial membrane, and varying in dimensions, according to the amount of its fluid contents. The bony symmetry of the joint is exchanged for a distended and enlarged appearance, though neither round or regular in shape, having depressions where the synovial membrane is covered by ligaments, and protrusions when it is covered by extensible structure alone. In articulations which communicate with the tendinous synovial sacs the tumor is of increased dimensions.

These tumors, which are soft and fluctuating, are marked by a degree of heat upon the surface, and they are apt to be surrounded with more or less œdema of the cellular tissue, and though the pain may be slight, it may still cause lameness. As we have before observed, the acute stage is rapidly succeeded by the chronic, and though lameness always accompanies the former, the latter is usually exempt from that association, except when there is considerable dilatation of the capsule. The lameness in these cases, according to Rey, is due to the inability of the ligaments because of their relaxed condition, to prevent the displacement of the articular



surfaces. Cases are recorded in human surgery in which the ligaments had entirely given way, and the consequent absence of restraint permitted a freedom of motion greatly exceeding that of the normal state. Although this must be of rare occurrence in animals, Lafosse has seen a case in a horse in which the relaxation of the ligaments in the coxo-femoral joint was so extreme as to permit the head of the femur to pass easily in and out of the acetabulum.

*Pathological Anatomy.*—The liquid usually contained in a hydrarthrosis is a transparent, citrine-colored, albuminous serosity, coagulable by heat. It is changed synovia. The inner face of the synovial membrane is sometimes covered with numerous small vascular projections, and again, the cavity is sometimes divided by fibrinous bands. The serous membrane is thickened and more adherent to the surrounding tissues, and loses a portion of its transparency. The ligaments and sub-synovial cellular tissue are usually intact, but in old cases may become thickened and indurated, and according to some writers, contain calcareous deposits, which give them a cartilaginous appearance.

*Progress—Duration—Terminations.*—The accumulation in hydrarthrosis is rapid, and twenty-four hours, in some cases, may suffice for the completion of the dropsical condition. But usually the process

is more tardy, and in some cases its developement is interrupted, and it seems to become stationary. In cases which are merely the result of overwork, it may disappear, without active interference, under the influence of rest alone; and a moderate effusion from other causes, if of recent date may also sometimes end in spontaneous recovery. But usually, once fairly established, it becomes persistent, with a constant liability to assume complications with other more or less serious articular disorders. The establishment of the chronic state, with a constantly increasing accumulation of fluid, is the usual termination of the attack.

*Prognosis.*—Considered independently, this disorder, except when it has assumed unusually extensive dimensions, is not one of a serious character. But there are cases in which it constitutes an important blemish, and largely diminishes the value of the diseased animal, since, when largely developed, it is both an element and an evidence of weakness in the affected joint, and becomes a proof that the animal has been made a victim of abuse by being overworked. It is all the less amenable to treatment when its appearance becomes the result, or betrays the existence of a defective constitution in the animal. The tendinous variety of the disease is less refractory to treatment than the articular.

*Causes.*—Hydrarthrosis originates from both internal and external causes. Those of an external, or traumatic kind may be specified as blows, violent efforts, overdriving and racing, luxations, sprains, and excessive work, and to these may be added sudden movements, repeated jumping and overtasking the immature powers of colts with premature labors. It may also originate in an attack of arthritis, and is in fact, the chronic stage of that disease.

The internal causes are more obscure in their character, and less easier to detect, but their presence is proved by their effects. Rheumatism; exposure to cold and damp; the sudden disappearance of an œdematous swelling, or of an eczematous eruption, of grease, or of a purulent discharge—all these have preceded the developement of a dropsical effusion in the joints.

*Treatment.*—As with arthritis, acute hydrarthrosis is properly subject to treatment by antiphlogistic means, but in the view of some practitioners, vesicating agents are to be preferred to cooling applications, or astringents.

Chronic hydrarthrosis has also been treated by internal modes, and with benefit, when the cause has been of an internal nature. But external methods are largely the more reliable. In the category of local applications, frictions, massage and cold douches

have been recommended, but they are palliative rather than curative. Alteratives are of very little effect. The recovery under blisters and blistering liniments are affirmed by many to have been always of a permanent character, while others assert that the removal of hydrarthrosis, when it has occurred by vesicatory means, has been but temporary, and that the disease has returned when the means of cure have been suspended, and the originating cause left to resume its activity. The preparations and compounds of iodine have their advocates, but the benefit which has resulted from their employment seems to have been realized only in cases in which the dropsical condition had been recent. It is when all these agents have proved their inefficiency that the actual cautery offers itself as the most, if not the only reliable remedy known to our experience in the treatment of the disease before us, and we are called upon to determine whether we have truly, as some affirm, found in that the real and unfailing indication we have sought for. It is called a heroic remedy, and it is doubtless truly so called. But that is scarcely a valid objection, if its energy is of a salutary kind. The most important objection alleged against it is that occurrence among its results of serious blemishes. And its absolute, invariable and infallible success cannot be affirmed. But it may be



truly said of it that when its effects are favorable they are permanent—the disease is cured.

There is a class of cases, principally including those in which the restoration of the patient to his working capacity is the principal consideration, and the presence of a moderate disfigurement of no great moment, in which, in our opinion, great advantage, would accrue to both the animal and the owner, from the use of the cautery at the beginning, immediately upon the subsidence of the acute symptoms. We cannot concur with the recommendation, by certain English authors, of the use of the seton, or that of the French writers who have employed the method of galvano-puncture.

The application of pressure has been followed by favorable results, but it is often difficult to arrange and regulate, and cannot be employed with sufficient method. Bandages of Indian rubber have been used. Plasters have been tried. And so have charges applied hot and secured by dry bandages.

The simple puncture with the bistoury or trocar has had little curative effect, and is often followed by fatal inflammation of the joint. This is, however, of unfrequent occurrence, and may be obviated by the application of strong counter-irritants. To obviate the possibility of the entrance of air into the cavity, Hertwig directs that the puncture be made

obliquely, or the introduction of the trocar under the skin for some distance, before perforating the synovial membrane. If any important or permanent advantage is likely to be secured by emptying the sac, the best and safest means of effecting the purpose would be by the method of aspiration. But from the fact that the cavity is so often multilocular, in consequence of its division by the pressure of the various bands which form the septums, the entire removal of the fluid becomes impossible, without such an amount of manipulation of the joint as would be certain to result in complications of the most serious character.

All the forms of treatment referred to having been found to be insufficient to prevent frequent relapses, in consequence of their failure to effect the desired and necessary modification of the morbid vitality of the sac, the method of effecting this became an important object of inquiry, and the suggestion was borrowed from humane surgery, of following the puncture of the sac with an injection of iodine—Leblanc, Sr., being the first to introduce this treatment into veterinary practice. It was supposed that the effect of the iodine would be such a modification of the diseased condition of the serous membrane as would excite in it an exudative inflammation which would be succeeded by the absorption of the exudat

and the occlusion of the serous surface where it is least exposed to the gliding movement of the joint. This, however, is just the result which renders such a form of treatment useless, if not dangerous, when applied to a case of articular hydrarthrosis, though in tendinous dropsies it may fulfill a good purpose. Probably it has not yet been sufficiently tested. It is certainly of a less dangerous character here, except when there is a communication between the tendinous and articular hydrarthrosis.

The free exposure of the sac by a large incision the introduction of the seton directly through the tumor; the puncture of the enlargement with a deep pointed cautery; the introduction of a sharp red-hot needle directly through the tumor--these are plans of treatment which may be discussed, but which cannot be recommended.

#### HYGROMA.

The effusion of either serous or purulent fluid in subcutaneous sacs, resulting from inflammatory action, whether acute or chronic, constitutes a hygroma, although the term is principally employed to designate the dropsical condition of closed cavities.

These cavities are usually of accidental origin, and vary in situation, according to the manner of

employment of the animal and the consequent pressure or friction occasioned by the special contact or bearing of the harness he is accustomed to wear. Although their situation is usually just under the skin, they may be occasionally found in deeper structures, or they may be discovered at the poll, or the withers or in parts of the extremities. They are formed at the expense of the areolæ of the cellular tissues enlarged under the influence of continued friction, and continued to other surrounding, making the final form that of a cavity divided into septums by bands of partitions. Owing to this mode of formation, these serous sacs contain no special elements of composition. They adhere intimately to the surrounding connective tissue, or rather, are continuous with it. There is much variation in the thickness of their walls, and they differ also in respect to their age, the frequency and the conditions of their formation, and the amount of the fluid they contain. Their appearance may be that of a bloody or serous tumor, or an abscess, and not uncommonly, they change wholly in consistency, by the thickening of the walls and closure of the cavity, and become converted into large fibroma.

*Etiology.*—External violence, whether suddenly inflicted or slow and continuous, is generally the cause. Bruises, pressure and repeated friction result



in the acute variety, while the chronic disorder is oftener the effect of chafing by the harness, the rubbing of the halter or bridle over the top, pressure of the saddle over the withers, or again, repeated frictions.

*Symptoms.*—Characteristic of a hygroma, there is a softish tumor more or less movable, painless, of a globular, or oblong and irregular form, according to the anatomical configuration of the subcutaneous situation, or again a painful and fluctuating tumor. Its consistency varies with its age, the walls, which are at first thin and depressible, by increased thickness and consistency, are soon transformed into indurated tissues.

The growth may be either continuous or intermittent. Sometimes they disappear by resolution, but usually, after attaining their proper dimensions, they remain stationary. Or they may resume their growth, after a period of inactivity, and increase until their bulk causes them to be obstructive to locomotion.

*Treatment.*—Various indications attend the treatment of this species of tumors. A preventive treatment is first indicated, which consists simply in the studious avoidance of all bruises, frictions, undue pressure, or any violence over the regions where the sacs normally exist. This treatment often assumes so great a degree of importance that the success of

the distinctively curative measures will be wholly dependent upon its faithful and judicious application. These latter may be arranged under three heads, and comprise *first*, the resolution of the fluid; *secondly*, the obliteration of the cavity by the adhesion of its walls; and *thirdly*, its extirpation.

Under the first head, the consideration occurs of the application of all the usual absorbants, alteratives and counter irritants, all of which have been recommended; with frictions of liniments, etc.; blisters, and mercurial inunctions. These have all been attended with varying success. Nocard strongly advocates actual cauterization in lines or in dots. Success has attended the treatment by methodical pressure where the form of the region permits it. Puncture is attended with only temporary advantage, in consequence of the liability of the collection to return when the puncture heals.

The puncture must be followed by the injection of irritating agents to secure the second condition, in the obliteration of the sac. Tincture of iodine, alcohol, perchloride of iron, and chloride of zinc are here indicated. The treatment is safe and harmless, and the suppuration which follows aids materially in entirely closing the cavity by the process of granulation.

The third indication is present when the contents

of the sac have become of a hard, fibrous consistency, and the walls have changed to a fibro-cartilaginous texture. It is then that the indication of extirpation presents itself, and becomes necessary to decide between the complete operation and the incomplete. This complete operation consists in the removal of the entire tumor, as it is sometimes found suspended at the end of a peduncle at the elbow. In the incomplete method, a portion only of the sac is removed, either by the cautery or the knife, for the purpose of preventing the closure of the cavity, and keeping the aperture open for the easier application of the dressings.

#### WOUNDS OF JOINTS.

Wounds of the articulations are classified simply by separating them into the two varieties of *deep* and *superficial*, not essentially varying from wounds in other parts of the body, except, principally, that when deep they may become complicated with suppurative arthritis. A subdivision distinguishes between the *simple* and *complicated*, the first term being applicable to cases in which the puncturing body has penetrated the capsular ligament, merely, while the latter term refers to cases in which the ligaments have been torn, the bone injured, or there

is loss of substance, or the lodgement of foreign bodies in the wounds.

*Causes.*—They may, of course, result from any cause capable of producing mechanical injury in any part, though as with every other region, necessarily subject to their own peculiar liabilities. Pricking with forks, kicks from other animals, falls upon rough or stony ground, attended with violent contact with sharp stones or other puncturing substances, are among the most common accidents likely to produce the traumatic effects in question. Very deep cauterization often gives rise to extensive sloughing, which when loosened, permits the escape of synovia.

*Symptoms.*—The direction and depth of the injury and the flow of synovia will at once betray the nature of the hurt, when there is penetration of the joint. After two days, the flow of synovia becomes quite abundant, the fluid, which is clear at first, soon changing to a yellow and thicker consistency, however, until it coagulates and dries over the opening, which it closes, as with a plug. At times, notwithstanding the depth of the wound, there is no escape of fluid, in consequence of the closure of the orifice by the displacement of the skin or of a tendon. It is important to distinguish, in an escape of synovia, whether its source is a joint or a tendinous sheath,



the prognosis varying materially, according to the fact. The probe may discover the facts in the case, but great caution is necessary to avoid the abuse of that instrument, troublesome complications being sometimes consequent on its injudicious use.

Articular wounds are not at first, specially painful, and the symptoms are not apparently of an alarming character, owing to which circumstances they are too often slighted, and the animal kept at work after receiving the originating injuries. But in from two to four days the evidences of arthritis are made manifest, and all the symptoms of the suppurative disease present themselves, accompanied by the fever of reaction more or less severe, with other phenomena belonging to disease of the joints, and the lameness becomes excessive and disabling.

*Prognosis.*—From its tendency to readily assume the condition of arthritis, any articular wound may be considered dangerous, the introduction of air, the motion of the joint, injuries to the bone and the presence of a foreign body, all being conditions calculated to excite the suppurative process, and to justify the surgeon in his apprehension of a fatal ending. The immediate seat of the injury in a wound of a joint is an important factor in the prognosis, the chances of recovery being greatly improved when perfect immobility can be secured. The result

is also greatly influenced, adversely or favorably, by the greater or less complexity of the part, and the depth of the wound.

*Terminations.*—The termination peculiar in the case of an exposed joint is ankylosis. The other terminations are those common to all traumatic lesions, and include cicatrization, suppuration, gangrene and purulent infection. Under favoring circumstances, and where the injury is properly cared for from its incipency, and the inflammation can be kept under control, cicatrization may be secured in a few days. The most favorable termination of suppuration of the articular surfaces is ankylosis. When gangrene or purulent infection develop, there can of course be but one result.

*Treatment.*—The main object in the treatment of exposed joints is the prevention of arthritis. To secure this object, three principal indications must be observed. As a preliminary step the wound must be freed from all foreign matters, if any are present, and thoroughly cleansed. It must then, *first*, be kept perfectly closed; *secondly*, the immobility of the joint must be maintained as perfectly as is possible; and *thirdly*, the developement of synovitis must be prevented, if possible.

To keep the wound completely closed is often only accomplished with difficulty. The suture may

sometimes serve, but frequently fails. Pressure may be successfully applied, but is not applicable in every case. Adhesive appliances have been recommended, one of the best of these being collodion; another being a mixture of alum and albumen. Caustics are frequently used. Rabel water, tannic acid, and especially corrosive sublimate have their advocates. The last named acting, when favorably, by coagulating the synovia and forming an eschar which closes and obliterates the fistulous tract. The application is made either in powder or in pencil form. The actual cautery, in various forms, and with different degrees of heat, is in favor with many. Perchloride of iron would also, doubtless, insure excellent results. But the best and safest of all topical remedies, and the most effectual in checking the flow of synovia and hastening the reparative process, as tested by Verrier and confirmed by our own experience, is the *Egyptiacum* ointment.

To secure the immobility of the joint is at times a task far from being easy of performance, as we have seen while considering the treatment of arthritis. We have been accustomed in our practice, when bandaging has proved inefficient, as the next best method to secure the patient in a narrow stall and put him in slings. Although this restraint is scarcely sufficient to prevent an up and down movement of

the legs, yet it is a relief to the animal, and keeps him quiet, and above all, it facilitates the application of the cold irrigation which, as our experience has taught us, is the very best mode of allaying the inflammation and preventing the developement of arthritis. If withal, this complication persists in establishing itself, it must be dealt with according to indications elsewhere considered.

### DISEASES OF MUSCLES.

The various forms of disorder to which the muscles are subject, will be considered under the following heads :

*First*, Inflammation ; *second*, neurosis ; *third*, atrophy ; *fourth* hypertrophy ; *fifth*, degeneration ; *sixth*, solution of continuity ; and *seventh*, parasites, and neoplasms or foreign bodies.

(1.) *Myositis*, or Inflammation of Muscles, notwithstanding the highly developed vitality of these organs, and the paramount importance of their functions in all animals, is comparatively a rare disease. Still, from the fact that when it occurs it is liable to become the cause of troublesome and even dangerous forms of lameness, it fills an important place in the field of veterinary study and practice.

*Symptoms*.—Swelling and pain of the muscles,



with accompanying difficulty of locomotion are the characteristic signs of myositis. Its progress is sometimes slow, sometimes rapid, and sometimes periodical. It begins with acute pain over the course of the affected muscle, which is increased by pressure, the slightest touch causing fear and shrinking. Motion of the part is diminished, or impossible and as the muscles are more or less retracted, there are corresponding peculiarities of movement and posture. The muscle is more or less tumefied and gives a feeling to the touch of a peculiar induration. There is more or less fever, anorexia and thirst, with disturbance of the circulation and of the respiration.

*Progress and Termination.*—Its progress is usually slow, and it generally terminates by resolution, except when complicated with oedema under the abdomen or in the legs. It may pass into the chronic state, in which case the local symptoms become less marked, and it may stimulate a mild attack of laminitis. In such case there may be indurations and retractions or shortening of the muscles, and these are all complications which may involve deformities resulting in lameness. Suppuration may occur in cases of a traumatic origin, but in other cases is of rare occurrence. Lafosse mentions gangrene as at times forming one of its terminations, occurring after a severe traumatism, and preceded

by excessive fever and intense sensitiveness of the vertebral column. In these cases only a fatal result can be anticipated.

*Causes.*—Myositis has been observed in horses of a strong, robust and plethoric habit. Perhaps this class of animals is more liable to its attack than less vigorous and vivacious individuals of the species. A sudden suppression of perspiration may form a common occasional cause, and may give rise to either the acute or chronic form. Overwork of the muscles, or a rupture, or a laceration may be a cause in a traumatic case. Chemical and atmospheric causes as heat, especially burns or scalding, and electricity may be mentioned; surgical operations, as setons, or acupuncture belong to the category, and it has been observed as the effect of the violent struggles of an animal which had been thrown for operation.

*Treatment.*—This is usually of the local kind. In the acute form, antiphlogistics are indicated, comprising compresses with saline solutions, poultices, with anodyne frictions, embrocations of camphorated ointment, populeum, etc. The chronic form, on the other hand, requires stimulant treatment, and alcoholic frictions, ammoniacal liniments, and even blisters, and, as Rey recommends, sinapisms, will be demanded. The occurrence of suppuration, gan-

grene or abcess should be met with the usual treatment of those affections.

(2). *Neurosis*, in some of its numerous forms, is not likely to be absent from such a condition of innervation of the locomotive function, and the patient will scarcely escape the disability and suffering attending the access of that peculiar spasmodic contraction in which the apparently "knotted" muscle forms the hard and painful tumor known as a cramp. The cause of this affection is little known, and its effects vary according to the region or organ in which the attack occurs. But during their continuance there is always a serious interference with the normal movements of the part, which then acquires a condition of violent, uncontrollable and painful fixity, whether in a position of flexion, extension, abduction, adduction or shortening. The contraction usually disappears spontaneously, and is not usually of long duration. There are cases, however, of more protracted continuance, and sometimes of recurrent attacks. The adult animal is less liable than the youthful, to this form of disorder, and notwithstanding their liability occasionally to return, there need be no apprehension of their final persistence or conversion into a chronic lesion.

The treatment called for in these cases is of a very simple kind, and includes dry friction, which is

usually sufficient to relax the contraction with friction with stimulant mixtures, warm applications, the cold douche and other sedative mixtures. Whatever embrocation is used must be well rubbed in.

(3 and 4). *Atrophy* of the voluntary muscles is more or less frequently; while *hypertrophy* of the same structure is very rarely encountered in the voluntary muscles. The atrophied condition is likely to be found in animals which have lacked proper care and nourishment, and have suffered from poor and scanty regimen or other causes of depressed vitality, but it may be looked for as more commonly the result of a depraved nutrition of the muscular structure from inaction, and for this reason it is often present in regions which have been the seat of chronic disease. The protracted disuse of the part consequent on fracture, ankylosis, chronic arthritis, or other similar lesions, must also operate as a predisposing cause; and it is known to have resulted from the pressure of a tumor of the muscular tissue.

The treatment of atrophy must be suggested by a knowledge and study of the circumstances incident to each individual case, and must be varied and modified according to the judgment of the attending surgeon.

(5). *Degeneration* of the muscles occurs in several



ways. In the *fatty* kind, the adipose, instead of being deposited between the ultimate fibres of the tissue, exists in their interior. In the *granular*, the ultimate fibres become swollen and opaque, and are filled with granules of a finer texture. In the *waxy*, the fibres have lost their transversal striæ, as in the fatty, but instead of continuing colorless, they assume a yellowish hue and a waxy consistency. These are the forms which have been principally observed in domestic animals, and they have been chiefly found in those suffering from paraplegia.

*Melanosis* is a common affection of the muscles of equines. The melanotic substance is sometimes found in large quantities.

(6). *Solutions of Continuity*, comprehend Wounds, Dislocation and Ruptures. A wound of a muscle does not differ from a similar injury of any other soft or vascular structure. In a rupture the organic fibres are broken by some effort involving their over-tension. They are of very common observation, and may be either complete or incomplete, according to the extent of the lesion. They are very rarely followed by suppurative inflammation, the recovery being usually prompt and certain. The dislocation of a muscle, where the displacement occurs independently of that of a bone, is a lesion of continuity very rarely noticed in solipeds, but has been detected in cattle.

(7). The *Parasites* which inhabit the muscular substance are found both in the cellular tissue and the ultimate fibre of that structure. The *trichina spiralis* inhabits the former, while the latter forms the habitat of the *cysticercus*, the *echinococcus* and the *actinomycosis*. Their existence, except in very large numbers, does not seem to be productive of any mischievous effects. When not sufficiently numerous to interfere with the muscular function, they may be considered innocuous.

The muscular tissue may become the seat of *tumors*, such as the *hæmatoma*, the *cancerous growth* and the *myoma*. The occurrence of any of these growths in our domestic animals is, however, one of great rarity.

## DISEASES OF TENDONS.

Though lesions of these organs of a nature to involve vital consequences are rare, yet those which constitute mere physical injuries are of frequent occurrence, and in some cases become sources of great damage from the impairment, if not the entire loss of their functions.

Diseases of the tendons may be considered under the three heads of *first*, inflammation; *second*, degeneration, and *third*, solution of continuity.

(1). *Inflammation of Tendons*, or *Tenositis*, is an affection which many authors refuse to recognize, holding that its existence is incompatible with the general low condition of the capillary circulation of these structures. But if inflammation may exist in the interstitial cellular tissue which unites the rudimentary fibres, and this is necessarily true, it may as certainly exist in the tendon itself. The form most commonly encountered is the traumatic.

The *symptoms* of this lesion are a rounded swelling, usually of limited extent, at the seat of the injury, and heat and pain of the skin covering it. A little hesitancy, or slight lameness may be the sum of the interference of the disorder with the action of the part. But when the injury has been extensive, the symptoms will be correspondingly exaggerated, and the pain aggravated by the unyielding nature of the inelastic tendinous sheath.

*Progress and Termination.*—With timely discovery and treatment, tenositis subsides in a few days, but otherwise its persistence until it assumes a chronic form, is not a uncommon circumstance. Under this condition the tendon becomes enlarged, thickened and contracted, and serious deformities may ensue, as exemplified in a sprung knee, or a knuckled fetlock.

The *Causes* are numerous, external violence, producing wounds and bruises, with the strain of over-

work predominating, and the horse is in a majority of cases, the sufferer.

The *Treatment* includes the usual applications of topical medication. *The acute form* will generally subside under the influence of absolute rest, moderate pressure, and the milder remedies in general, the appliance of cold taking precedence of the rest. But in the *chronic state* blisters, with iodine alteratives are demanded, with the allied mechanical effect of high heeled shoes, and long rest, of course. This course will often insure relief, and still, cases will arise in which the actual cautery is the remedy *par excellence*.

(2). The *Degeneration of Tendons* is mostly one of the resulting accompaniment of old age. It has been noticed by Lecocq, who found it more prevalent in the donkey tribe than among horses. Its usual form is a calcification of the tendinous substance, through the deposit of solidifying carbonate or phosphate of lime.

(3). *Solutions of continuity* in tendons are of four kinds. *First*, wounds with cutting instruments; *second*, wounds by puncture; *third*, strains, or incomplete ruptures, and *fourth*, ruptures, complete the list.

(1). *Wounds with sharp, cutting instruments*: these cause but little pain. Their leading peculiarity is the distance which is noticed between the severed



and retracted ends, when the separation is transverse and complete. When the wound is subcutaneous, it may be detected by the vacancy which can be felt between the divided ends, which, however, is soon filled up with blood. Tendinous wounds are not at first attended with much pain or great lameness, but after a period sufficient to develop inflammation in the skin covering, or the cellular tissue underlying the wounded part, and especially if there has been an access of air into the wound; an increase of swelling, an enlargement of the parts, an access of pain and an aggravated condition of lameness, will follow any sharp contact with a metallic edge or projection, with sufficient force in the contact, being capable of severing a tendon, such a result may easily follow a runaway performance, or a restive kick against an angle of a carriage by a fractious or frightened animal.

In the partial division of a tendon, simple applications will be sufficient to effect, or to aid the cicatrization. Yet the cases will vary as to whether the skin is broken or whether it remains intact. If the division has occurred subcutaneously, union by the first intention may be secured by simply maintaining the ends in contact, or if they are separated, by the organization of the exudation which fills the space, between the ends, and after a period of a month or

more, the restoration of the organ to its normal form and function will be accomplished. But if the wounded ends, through the opening of the skin has been exposed to contact with the atmosphere, the case assumes a serious character, and even fatal results may be apprehended. The ends of the tendons, at first pale and lifeless, soon become vascular and reddened, and covered with granulations, which soon unite with the surrounding tissues.

If kept under control by judicious treatment, these granulations may in a short time change their character somewhat, and assuming the form of a simple flat surface, will continue to occupy the region of the wound. But the slightest neglect or mismanagement of the case may cost dear, by deranging the reparative process and exciting a rapid and unwholesome activity, which cannot be checked until it has brought forth its evil fruit. This appears in the form of a large fungoid body, which develops into a sort of cauliflower excrescence, and is apt to be quite rebellious to ordinary methods of extirpation.

As the essential object of treatment must be the coaptation of the severed ends and their maintenance in contact, the applicability and value of the suture becomes obvious, if the difficulty of obviating the effect of the irritation due to the presence of a foreign body in the wound can be overcome.

The position in which it will be necessary to confine the limb which is the seat of the lesion will be determined by observation of the precise point of injury and the special function of the implicated tendon, the wound, of course, leaving the limb either in a state of excessive extension or extreme flexion, as determined by the natural muscular action of the part. When the skin is divided, the indication will be met by bandaging, the roller being sometimes applied above and below the wound only, and not over it. In our own experience, the bandaging which supports the whole region is generally to be preferred. The use of splints will sometimes be unavoidable, and those of metallic material, ingeniously contrived to meet special indications, have sometimes been found very serviceable. The limitation of motion through the confinement of the slings is also at times a large factor in the case. Whatever may be the means and appliances brought into requisition in the treatment of the divided tendon, the great indispensable condition and essential indication is immobility of the part.

(2). *Punctured Wounds* frequently occur in complication with serious injuries, and are aggravated in their effects beyond those which might follow a simple puncture, by attendant inflammatory lesions of surrounding tissues, and the accumulation of

purulent matter. When this occurs, the indications which present themselves are the liberation of the pus by free incisions, or, as recommended by some authors, the entire division of the tendons.

(3). *Sprains, or Incomplete Rupture* may have either the tendon itself, or its sheath alone for its seat. Undue muscular effort is the usual cause of this lesion. Its characteristic phenomena, with the indication of the treatment demanded for its relief will be brought under consideration when we direct our attention to the subject of the *Injuries of Special Regions*.

(4). *Complete Rupture*.—The extreme solidity and cohesive power of the tendinous cords, great as it is, does not always render them proof against the violent contractions of the muscles of which they form the continuation, and their complete disruption is the result of their failure to bear the over-tension. The more common examples of these lesions occur, first, in the tendons of the flexor metatarsi; next in those of the flexors of the phalanges, and next, in the tendon Achilles.



## CHAPTER III.

### SPECIAL DISEASES OF THE EXTREMITIES.

#### ANTERIOR LEG.

##### SHOULDER JOINT.

The anatomical complications which enter into the formation of the shoulder joint, and the importance of the functions which it is designed to perform, together with the special liability to external accidents which it incurs by the prominence of its situation, sufficiently explain the interest of the subject and the necessity of prosecuting the study of its pathology.

The lesions of this joint are divisible into two classes, comprising, *first*, those of the superficial parts, as the skin and the cellular tissue, and *second*, those of the bony and muscular apparatus.

##### LESIONS OF THE SKIN AND CELLULAR TISSUE.

##### GALLS—ULCERS—ACNEA.

The peculiarly exposed situation of the anterior parts of the shoulder region, by which they are rendered liable to every species of contact, and their constant subjection to pressure and friction from the

collar or breast strap, necessarily results in the development of the morbid phenomena so frequently found in laboring animals, and their manifestations in the various forms and degrees in which they are so familiarly known, even to laymen. They, of course, appear under various aspects, and are temporary or permanent, deep or superficial, slight or severe, according to the mode of their manifestation and the intensity of the violence by which they are produced.

The effect of constant friction and heavy pressure by the lateral movement of a collar, too large or otherwise misfitted, will be chafing and excoriation, which must unavoidably result in injury to the epidermis. Or the true dermis may be the seat of injury, and the degree of severity so far enhanced that even mortification may occur followed by the sloughing of portions of the diseased skin, with total disability of the patient to perform his accustomed labor.

This is the condition of *galling*.

Following this, if the originating cause is continued, the condition of the anterior border of the shoulder becomes changed to that of a flattened, tumefied formation, composed of infiltrated cellular tissue of a hygromatous appearance, and this again, if there is still no interruption of the causal violence,

will result in the appearance of acute phlegmönous tumors, and the development of warm and acute abscesses.

The friction of the collar is productive of other lesions of the skin, if not so serious or dangerous in themselves, yet still embarrassing and troublesome, including various tumors, hard and soft, and sometimes followed by a process of suppuration. True *acne* spots also appear, and these little tumors are usually far from being easily amenable to treatment, though none the less disabling to the suffering animal. They are usually encountered along the anterior border, but are not often known to assume sufficient dimensions to entitle them to a place in the category of the true abscess.

The curative in all these modified forms of ailment, though agreeing in one point, to wit, the absolute exemption of the irritating causes just at fault, is simple in its general nature, though varying somewhat in detail, according to existing circumstances. The release from labor must not be made contingent upon the degree of development in the case. However slightly marked, the lesion may be, the only security against the risk of increasing the existing evil, lies in the total abstinence of the patient from labor while under treatment. It is of the first importance to wait for the entire disappearance of all signs

of chafing or superficial excoriation, before returning the horse to his work. A relapse may involve the formation of large indolent infiltrations, which are quite apt to be permanent under all methods of treatment. It is when the inflammation of these growths has assumed a degree of activity sufficient to result in the formation of an acute abscess, that the indication of treatment becomes at once obvious and its effect favorable. A free incision, to liberate the purulent accumulation, and sufficient time for the completion of the healing process, will end the case.

The developments of these acne tumors, with their tendency to ulceration and suppuration is far from being of easy prevention. When the ulcerative process is insufficient for their removal, they must be opened with bistoury, though even this will not insure their extirpation. We have known them to reappear nearly as rapidly as they could be removed. When they become indurated, the suppuration may often be hastened by cauterization with a pointed iron. Bouley's opinion is adverse to the removal of such as have attained unusually large dimension, from an apprehension that the thin and delicate cicatricial tissue which forms their final covering will seldom prove to be sufficient to resist the subsequent pressure and friction of the harness.



When the chafing is only superficial, or if it be deeper, and following the cicatrization of a slough, or the closing of acneous abscesses, mechanical means may be employed to prevent the recurrence of the evil. If the animal cannot be long enough spared from his work to secure the perfect accomplishment of a cure by rest alone, much may be affected in the way of relief by the special fitting of the collar, by padding or chambering, or other methods of securing its proper adjustment. We have often overcome recurrent attacks of acne by the application of a double soft collar between the ordinary collar and the skin, and we have seen great benefit attending the use of felt, thin leather, or of similar material.

General topical treatment is nearly always recommended, astringents and refrigerants in cases of simple erythema; or warm fomentations, soothing embrocations, or other agencies of a stimulating character for the promotion of sloughing or suppuration, according to the requirements of the existing case, and the particular lesions presenting themselves at the time.

#### COLD ABSCESS.

From the great similarity of the tissues involved with them, and the lesions of the cellular tissue of

the region of the shoulder, with the frequency of their occurrence on the lower part of the anterior border of that joint, we are led to assign to that region the affection now under notice.

The discriminating title of "cold," to distinguish it from the acute abscess, is given to it in reference to tendency of the inflammation in which it originates to assume the chronic character from its inception, this being its essential symptomatic feature. It is the idiopathic or primitive abscess, *par excellence*, and is essentially a local affection, originating in local causes, being as in the lesions, already referred to, the effect of the friction arising from the movement of a loose and ill fitting collar. It may be looked for at the base of the neck, at the lower part of the anterior border of the shoulder.

Its first appearance is usually in the form of an indurated tumor, slightly warm, and not very painful, oedematous at its periphery, and at times giving rise to a large swelling enough to involve entirely the lower part of the neck. No fluctuation can be detected in any part of the enlargement. The tumor becomes better defined, in a short time, in consequence of the subsidence of the oedema. In size there is variation, but in characteristic features there is uniformity. It is hard, but little, if at all, painful on pressure, without heat, and without

change from the natural color, and if unmolested, it continues unchanged for long periods of time. The recollection of these characteristics, in connection with the consideration of their local situation, and their clinical history will easily guide the surgeon to a correct diagnosis. The fact, as remarked by Bouley, that there is suppuration in ninety-five hundredths of known cases, is sufficient to justify their exclusion from the list of fibrous or indurated tumors.

The cold abscess is not a serious lesion, and the prognosis of a case would be a simple matter, but for the slowness of their developement, the persistency of their duration and their indisposition to cicatrize.

The first indication in respect to the treatment of these tumors, when their clinical history justifies a suspicion of the presence of pus, is the verification of the suspicion by exploration. To effect this, either a pointed bistoury, a fine trocar, or an exploring needle may be used, and it will sometimes be necessary to push the examination to a considerable depth. If the puncture is followed by the escape of the suspected fluid, the tumor must be opened to the bottom by a free incision, by which the entire collection may be discharged. Then, as there will be a strong tendency in the wound to

close, even before the escape of the entire deposit, measures must be adopted to contract that disposition, as well as to encourage an active inflammatory process, in order to promote the solution of the thick walls of the sac. The cautery affords the means for this. It should be applied with a pointed iron, deeply introduced and so manipulated as to bring it into contact with the parts as extensively as possible. Stimulating applications on the surface will also be serviceable in order to enhance the effect of the cautery. These will include the usual alterative and irritating substances, as cantharides, and others of that class. The introduction into the tract made by the cautery of a mixture of basilicon, populeum, rendered more active by the addition of a little cantharidal ointment has often accelerated the suppuration of a very indolent abscess. But it frequently happens that the exploration fails to detect the presence of the purulent deposite, which may be too deeply lodged, or too scant in quantity to identify, or the indurated character of the tumor may account for its absence. In such a case the entire dissolution of the tumor must be accomplished, and the incision and opening already made must be utilized, for the introduction of the needed medicaments. The cautery, reapplied with long and fine irons, red hot, and carried to the bottom of the



mass, will here be indicated, and this must be supplemented by the potential cautery, for which the usual caustic substances may be used, until the tumor has been finally extirpated. The same detail in the method is not always necessary, and in some instances the direct injection of irritating substances into the centre of the tumor, for the stimulation of the suppurative process is considered to be the preferable treatment. In any case much caution is demanded in the selection of the irritants, to be employed, with due discrimination against such as are not sufficiently amenable to control. Inattention to this caution has sometimes resulted in extensive swelling and suppuration of a very serious and threatening character. Our experience with a saturated solution of chloride of zinc has been quite favorable. The injection of one or two drachms of this article into the centre of a large tumor has excited a sufficient amount of inflammation to allow its free opening in a few days.

The tenacity of these tumors, with their disposition to relapse, and the abstention of the patient from his work involved in their treatment and the time which it occupies, have induced some veterinarians to favor the speedy removal of the diseased mass by cutting out the more superficial portions of the thickened walls. This is poor surgery, and is

hardly admissible, even when the growth is of a well defined and limited extent, and much less when the abscess is surrounded by a large œdematous swelling in which case such a suggestion must be entirely ignored. In respect to this species of swelling the wiser plan will be to wait for its subsidence, at the same time encouraging its absorption by local stimulants, such as poultices, warm fermentations, and the various embrocations in use, before having recourse to the exploration.

But the treatment of a cold abscess by external medication alone has never, in our experience, proved permanently beneficial. Cantharides, alteratives, iodine, mercury, and their kind may, any of them, apparently wholly or partially remove the neoplasm, but the slightest revival of activity in the original formative cause, or the retention of the smallest portion of pus in the cavity of the abscess will insure the return of the disease in as bad a form as before, with the additional disadvantage of the loss of irretrievable time which might have been saved by promptly, resorting as the initial step, to the exploratory operation.

## LESIONS OF MUSCLES, LIGAMENTS AND BONES.

## SPRAINS.

*Sprained shoulder, wrench, and slip of the shoulder,* are terms frequently employed to designate the lesions of that part of the extremity which among the French veterinarians, passes under the name of *ecart*, because, as they affirm, they have the effect of causing the horse *à écarter le membre du thorax*." By the Germans it is known as *Buglahmeit*, *schulter-loehmeing*.

In many cases the true seat of the lesions which are characteristic of this form of injury is in the soft structures of the joints, or surrounding it, including the muscles, the tendons, and perhaps the ligaments. In others the articulation itself may be the part involved. The complexity which is characteristic of the anatomy of the entire region, with the lesions, justify the conclusion accepted by common consent, of the complicated character of the pathology of this disease. It in fact requires no small exercise of critical acumen to determine invariably whether it is seated in the muscular system, affecting the *antea* or *postea* *spinatus*, or the *flexor brachii*, as in some cases ; or whether, as in others, it is the ligament of the joint itself, or the tendons which surround it ; or again, whether it is in fact the bones

and not the muscles at all, and if so, whether it is their articular surfaces, or the fibro-cartilage over which the tendons glide, as that of the bicipital groove; or whatever may be the structure or tissues that enter into either the anatomy or the physiology of the shoulders, and are liable to suffer by reason of a sprain or a wrench.

Muscular lesions will vary in respect both to the location of these organs, and the special circumstances of their occurrence, and there will be many niceties of difference which only the critical judgment of the expert pathologist can discover. Thus, in hurts from excessive stretching or tearing which have occurred during the flexure of the joint, he will point out the coraco-radialis, and perhaps the mastoido-humeralis as the injured muscles. If the injury has occurred, while the limb was extended, he will fix it upon the olecranon muscles. When during abduction, it will be the sub-scapularis, or the pectorals; when in adduction, the antea and postea spinatus. But if the muscles are affected in common, the tendons may participate as well.

Bouley has observed cases both of synovitis and arthritis, Rigot, Renault and Leblanc mention chronic lesions of articular surfaces; while extensive periostitis of the upper end of the humerus, with ulceration of the bicipital groove have fallen under



our own observation: a condition which has not escaped the remarkable observation of Percival, who thus writes :

“ The tendon of the *flexor brachii* passes down  
“ from its attachments to the scapula within a groove  
“ formed between the tubercles upon the head of the  
“ *os humeri*, and plays up and down within this  
“ groove, after the manner of a rope over a pulley,  
“ the surface both of tendon and groove being  
“ coated with articular cartilage and being enclosed  
“ within a synovial sac. Now, from the circumstances  
“ of this muscle being mainly employed in bending  
“ and raising the arm, of the known liability of bursal  
“ joints, such as this, to get out of order, and of the  
“ presumed and pretty well ascertained seat of ail-  
“ ment being the *point of the shoulder*, a part directly  
“ opposite to this bursa, there seems good reason for  
“ believing that this said bursa is the especial or usual  
“ seat of derangement or disease in shoulder lameness.

The most frequent causes of shoulder lameness being wrenching, spraining, stretching, and blows the most common causes of these, again, are slipping and falling, occasioned by travelling upon steep and irregular roads, or upon greasy or icy surfaces, as in resisting the pressure of a heavy load from behind, while moving down a declivity, or in dragging such a burden upon an ascending road. Slipping,

when alighting from a jump; balling with snow; violent abduction; it is quite unnecessary to undertake the enumeration of the multifarious methods, of contracting the hurts by which this form of lameness is generated. One more, however, may be added, by referring to the lateral jerk, to which the dray horses of our cities are subjected in their efforts to escape approaching rail cars by hurrying across, or especially when moving obliquely out of the street track.

Added to these external and traumatic causes, we may refer to those of a constitutional character, and include rheumatism among the number.

The peculiar anatomy of the superior part of either the anterior or posterior extremity renders its examination a difficult task, the large masses of muscle by which they are covered effectually preventing their exploration with the facility with which other parts may be manipulated. The anterior limb offers special obstacles to the work of the surgeon, from the greater compactness and solidity of the parts, and closed attachment to the chest. One effect of this solidity being a difficulty of discriminating, arising from the sympathetic susceptibility of the upper and lower regions, which may cause a sympathetic and responsive irregularity of action in the former when the latter is the true

seat of the lesion. Under such circumstances some degree of confusion or hesitancy in the diagnosis cannot always be avoided.

Still, there are conditions in which a positive and reliable diagnosis of shoulder lameness is not only practicable, but easy and sure, the objective characters being too well marked to admit of misinterpretation. Thus, in an animal suffering from lameness in one fore leg, with the shoulder being the seat of a swelling, and evidence of pain on pressure or percussion, exaggerated when excessive motion of the shoulder is produced by external manipulations, the location of the lesion cannot be ignored.

The mode of progression, in shoulder lameness, when the patient is compelled to walk, is characteristic. There is but limited motion in the upper segments of the diseased leg, and a forced limitation in the flexion of the radius upon the humerus, with a failure of the limb to move freely forward, instead of which a motion of circumduction takes place, by which the limb is swung outward by a movement so characteristic as to give rise to a sort of proverbial saying, that "it is an infallible sign that the grief is in the shoulder."

It is a remark of Percival that "in shoulder lameness, the horse neither points with the foot of the lame limb, nor usually stands upon it differently

“from what he does upon the sound leg.” The second part of the statement is correct; and may be verified by observing that both in the act of walking, or when coming to a rest, the foot is planted flatly on the ground, the entire plantar surface coming down at once. But, the first part of the remark must be accepted with some explanation. The animal does not truly point, as in navicular disease, but frequently rests his leg forward, as in pointing, but with the difference that in shoulder lameness the foot rests upon the entire plantar surface, instead of the toe alone, with raised heels, as in navicular arthritis. Together with this and others another intelligible sign must be taken into account, in the inequality which occurs in the length and quickness of the steps, the body being suffered to rest upon the sound limb for the longer period, while the painful side is relieved from its weight by a greatly accelerated, or hopping motion. Or the pain may even be so severe that the limb is withheld from motion entirely, and the act of progression accomplished by a series of short jumps, in which the three sound legs alone participate, the diseased member being held immovable and in suspension at the side of the thorax.

But it frequently occurs that diagnostic signs and objective symptoms alike are wholly absent, when a

true and satisfactory diagnosis becomes a work of greater difficulty. A careful excessive motion artificially produced is here of great service. Here is an effectual method for applying this test, and critical search for the rational symptoms then becomes necessary. The foot must be minutely and thoroughly inspected, and every part of the leg carefully examined by pressure, and even measurements should be accurately made, of both sides, for a comparison of dimensions. With one hand resting on the arm or over the point of the shoulder, the other should be employed in moving the implicated limb. This should be done more or less forcibly, and the leg should be subjected to all the varieties of natural movement by being flexed, extended, adducted or abducted, and also contorted. By such means the seat of pain may be made to discover itself and an important advantage sometimes secured. But the results of such an examination must be accepted with caution, and in the words of Percival, "we must confess our diminished faith "in tests like these, compared with such as are "afforded by action and the absence of any cause or "suspicion for lameness elsewhere." Symptoms derived from the action of abduction of the leg cannot be considered as belonging exclusively to shoulder lameness. We have met with it in animals



lame in other regions and from other causes. In Zundel's view, if it is truly and essentially characteristic, it is only in recent and severe sprains.

Much assistance in the diagnosis of obscure cases may be rendered by observations of the peculiarities of movement which accompany the act of locomotion. The suggestions of authors on this point are various. According to one, if the horse is made to trot, on the lame leg in a narrow circle, he will put his foot on the ground without hesitancy in order to save the shoulder. Another suggests backing, when the pain attending the movement will cause him to drag the lame foot. Another advises trotting on soft ground, where the feet will sink in the earth, and the extra exertion expended in drawing them out will betray the seat of the trouble by the increase of the lameness and pain, which will be much less marked when the foot is the weak member, than when the shoulder is affected. According to Hertwig, a horse lame in the shoulder stumbles frequently, and Dieterichs thinks the soreness is more marked while ascending, than while descending a hill.

The atrophy of the muscle, or "wasting of the shoulder," the "sweney" of old hippiatry, is at best but a remote cause of the lameness, since it is observed, not in injuries of the shoulder alone, but may also exist when in any part of the leg there is

a lesion sufficiently serious to restrict freedom of motion and compel a condition of inactivity or even absolute quiescence.

The prognosis in any case of lameness of the upper region of the leg may always be considered serious, not only from the danger of a fatal ending, but in any case, on account of the deterioration of the animal in commercial value. It will of course be modified according to the degree and nature of the producing ailment in the case, but under any circumstances the practitioner will do well to make a guarded expression of his views, from the fact that the spontaneous recovery of cases which had been pronounced to be beyond treatment has not unfrequently taken place under the influence of complete rest alone, without help from other agencies.

The treatment of shoulder lameness will of course vary, according to the special features of each case. Much will depend on the reasonable subjection of the patient to the care of the surgeon, as of course there is a better promise of favorable results in a recent, than in an old and neglected case. The first and most indispensable indication is rest. Confinement in a single stall, rather than a box; securing him in such a manner as to restrict his movements and prevent him from lying down; and the application of hobbles, which will prevent motion and keep

his feet close together, are methods which are recommended by many practitioners, and are even sometimes considered sufficient of themselves to insure recovery. Recent cases are benefitted by local treatment, and for this, cooling lotions, continued irrigation, and the cold douche are favored by French and German authors, while English writers, with Percivall, propose warm water fomentations, "*persisted in*, and directed in particular to the point of the shoulder." Irritating treatment is also very beneficial, immobility of the part being largely promoted and aided by the effect of the irritants and vesicants employed. The tincture and ointment of cantharides, spirits of camphor, and any of the various well known stimulating medicaments will be in order here. Mixture of oil of turpentine, or the stronger ammoniacal liniments, must however be cautiously used, from their aptitude to overact, and excite an excess of motion in the patient. A blister over the point of the shoulder, and including a portion of the surrounding parts, is useful in sprains, whether old or recent. But if this with other external treatment should fail to procure the satisfactory results anticipated, resort may be had to a seton introduced under the skin, as a more efficacious measure. Percivall considers this as decidedly superior to the blister, in point of activity

and efficacy, but recommends it principally in chronic cases. There are various modes of applying this remedial means. A single one may be introduced along the anterior border of the scapula; or two, one at each angle of the shoulder; or, as Girard suggests, two, crossing one another at the point of joint. Gaullet proposes the insertion of several simultaneously, starting from the cervical angle of the scapula, along the anterior border, around the point of the shoulder towards the axilla, through the axilla to the point of the olecranon, and from there returning to the dorsal angle of the scapula, where it terminates near the place of beginning. This monster seton, though not often employed, may be used with undoubted advantage, from its effects in limiting the movements of the animal and its action as a powerful counter irritant, and excitant of the functions of nutritive absorption. Rowells are also not uncommonly used in place of setons, but we think, with less and more limited effect.

The actual cautery is much recommended and often applied in the treatment of chronic shoulder lameness, though its use is nearly always deferred until after the failure of other means. This is contrary to the opinion of Bouley, who holds that "it would be better to employ it from the start, when surrounding the joint there exist indurated swellings, indicating

“chronic lesions, of the articular surfaces, of the “tendons or the synovial membrane.” According to the indications present, it may be applied in lines over the entire scapular region, or over the point only of the shoulder; or the application may be made in points or penetrating dots.

Of course the potential cautery has not been overlooked in the devising of methods for the treatment of the lame shoulder; and good results have followed its employment. It is applied by simply depositing a suitable portion of the silver-nitrate, when that is the substance chosen, under the skin, on a level with the articulation, and allowing it to remain for a period varying from twenty-four to forty hours. No fear need be entertained in respect to the symptoms following. Neither the tumefaction, the absorption, the dimensions of the resulting slough, nor any other of the appearances attending the state of the wound need excite any fear. The only unfavorable complication that seems possible is the extensive undermining of the skin by the accumulated suppuration. But this is said to be easily controlled and remedied by means of a free opening at the most dependent point, to facilitate the escape of the deposited matter.

While it is obvious, that different attacks of lameness may and must be attributable to lesions of



the different structures which enter into the formation of the joint, with their various distinctive peculiarities, as of special vital function, special susceptibility to impressions and special vital activity, demanding its own special consideration, it is a fact equally obvious and true, as we have before intimated, that there is one indication common to each case and that is equally imperative in all. Long rest, following recovery is this essential and imperative condition of final cure in every case of shoulder lameness; a rest of months, either by placing the convalescent in a large box stall, or if possible, giving him an opportunity to take moderate exercise, to be limited and otherwise controlled by his own inclination. In no other way can the hazard of a troublesome and dangerous relapse be avoided with its aggravations of symptoms and complications of debility, and enhanced gravity of prognosis.

#### ELBOW JOINT.

The records of veterinary experience contains but few intimations on the subject of the etiology, the symptomatology and the nature of lesions likely to terminate in lameness of the elbow joint.

The peculiarities of formation which characterize this perfect hinge, in the strength of its ligaments, the peculiar power of the muscles which protect and

control it, and the perfect adaptation of the bones which enter into its structure, sufficiently explain the fact of the limited liability of this articulation to traumatic lesion, and at the same time account for the rarity of its mention by the books.

Yet there can be no doubt of the fact that such injuries, and of course the lesions in which they result have fallen under the observation of veterinary writers, and it is equally certain that none of the structures composing the elbow joint are endowed with immunity from disease and violence, with their natural concomitants.

Professor Williams, in his excellent work on Surgery describes among the lesions of the mass of the extensors of the fore arm, an injury which is not unfrequently encountered, in these terms: "the fore arm being flexed upon the humerus; the action of the flexor brachii being now unopposed, the knee is elevated, the leg flexed from the knee downward, the toe of the foot touching the ground, and the limb being semi-pendulous. When the horse is made to move he *drops* considerably, and seems in danger of falling at every step he takes, the limb itself almost bending double, when any weight is thrown upon it. This excessive *dropping* during progression is characteristic of elbow joint lameness. . . . . "

There are certain symptoms present in ligamentous lameness which materially contribute to a correct diagnosis. When the internal ligament is the seat of the lesion, the part will be very painful, with increase of heat, and usually some swelling. The function of locomotion will be much interfered with, and the lameness very considerable. The flexion at the elbow is very limited, with perhaps, a slight motion of abduction, and when moving, a well marked dragging of the toe when it is carried forward. While at rest, he stands comparatively firmly on his feet. In one case the pushing of the fore arm against the lower end of the humerus excited an evident manifestation of pain.

A case described by Percivall was peculiar on account of the symptoms of laminitis, which it presented. The lameness had continued for a long period, and the treatment had been directed to every region of the leg, but without successful result. In his description of the case, the author says: "During the early period there was nothing to strike notice in his manner of propelling or putting down the lame limb, save that he evidently did all he could in action to throw the weight of his body as it appeared to us, upon the *heel* of the foot; so that I more than once suspected chronic laminitis, and had on that supposition inserted a seton through

“the frog. When he had become lamer and was  
“consequently more unwilling still to impose weight  
“upon the lame limb, he evinced a sort of *dragging*  
“*of the limb after him* in his going; which symptom  
“it was, combined with an increased manifestation  
“of it in his side movements, that disposed us to  
“think his case was one of shoulder lameness. By  
“the time however, that he showed lameness in *both*  
“fore legs, and particularly when he became, as he  
“had latterly become, quite a cripple, he manifested  
“a remarkable *crouching* sort of action, dreading  
“almost to move his fore limbs forward, and mani-  
“festing such exquisite soreness and pain when com-  
“pelled to move on, that, while he was making as  
“short steps as he could, he was doing his utmost  
“to keep his body back and advance his hind limbs  
“to receive its weight, to prevent any of it or as  
“little as possible, falling upon his fore limbs. In  
“short, his posture and gait altogether were very like  
“that of acute founder; so like indeed, that, per-  
“haps, one might not be able to make a distinction  
“between the two diseases, were it not that in  
“founder the feet would show the nature of the  
“disease; and that in elbow joint disease, although  
“the animal manifested all the pain and dread of  
“stepping, yet, when the whip was applied, and he  
“found himself obliged to go, did he plainly show

“that his fear arose purely from the *pain* of the  
“moment, and not from any cause of absolute *inability* to tread; and further, that the pain evinced  
“at the moment of *putting down* the foot, as in  
“founder, but at the time when the body was required  
“to be advanced by the hind *upon* the fore limbs; at  
“the moment, in fact, that he was called on during  
“action to throw the slightest weight upon the  
“columns of bones, which he no sooner had done  
“than his body shrunk back upon the hind quarters:  
“in fact, it was evidently the effort to throw the  
“weight upon the muscles of the shoulder instead of  
“upon the bony column that occasioned that peculiar crouching gait. And every now and then, while  
“he was being compelled to walk, would he, at the  
“moment the weight came upon his four limbs,  
“crouch down to that degree, that lookers-on cried  
“out he would “fall;” on no occasion, however, did  
“he fall, but always saved himself by shrugging his  
“body back upon his haunches.” At the post-mortem examination, “the inferior or broader half  
“of the articulatory surface of the ulna presented a  
“patch of ulceration, of the shape of a figure whose  
“sides measured about an inch each. The transverse portion of the articulatory surface of the radius, which naturally is an eminence, had become a  
“fissure of ulceration of about a quarter of an inch



“in breath at its widest, which was its posterior part :  
“this ulceration extended but little more than half  
“way across the surface, the portion of surface in  
“front of it being sound. There was likewise a  
“patch of ulceration in the internal between the  
“condyles of the humerus, of a triangular shape, but  
“which, in that situation, would not be opposed,  
“either in action or at rest, to the ulceration upon  
“the ulna. There was a patch of discolouration  
“upon the front of the outer condyle a seeming pre-  
“cursory to ulceration. From the surface of the  
“ulcer upon the olecranon, there were granulations  
“springing up, which, it is to be believed, would in  
“the course of time have become osseous and formed  
“the nucleus for an ankylosis of the joint. There  
“was no disease of the periosteal or ligamentary  
“tissue outside the joint.”

## CAPPED ELBOW—SHOE BOIL.

This species of tumor is a growth varying in aspect, form and dimensions ; more or less circumscribed ; and painful ; movable and hanging from the point of the elbow joint. It is known as the capped elbow. It is *l'Eponge* of the French and *die Stollbeule* of the Germans. It is the result of pressure, bruises, or contusions, and is produced by the

contact of the heels, or the shoes on the fore feet when the animal assumes the *sterno-costal decubitus*, in imitation of the position of the cow when lying down. The manner in which the injury is inflicted varying according to the accidents peculiar to each case, there will be corresponding variations in the manifestations which severally present themselves, and there are consequently, four different forms of capped elbow recognized and treated by authors.

In the *œdematous* form the tumor is soft and puffy of various degrees of developement; not well defined, but covering the point of the elbow. It is not painful in any unusual degree. It is essentially formed by the infiltration and congestion of the bruised skin, which may present a point of depillation, or a serious exudation coming from the pressure of the shoe. At times, however, the œdema is warm and painful, and it becomes by its size and its tenderness a serious hindrance to locomotion, a considerable degree of abduction accompanying the act of progression. This condition, however, is not persistent, and after no long interval, the tumor assumes the *phlegmonous* form.

The tumor now becomes warm, painful, and somewhat hard, and the lameness is excessive. But after some days a softening takes place, fluctuation may be discovered, and *presently* ulceration follows, with

a discharge of thin, bloody suppurative matter, to be succeeded by extensive sloughing at the original point of injury.

The *cystic* form, or the *hygroma* of the elbow is the most common of the category, and usually assumes the chronic character, under the appearance of a generally well defined tumor, uniformly fluctuating, but rarely warm or painful, and containing in its cavity a yellow serosity, which partakes however, at times of a somewhat purulent character. The cyst is sometimes multilocular, having partitioning bands running from wall to wall and separating the whole into several cavities.

The true *indurated* or *chronic* form offers a tumor of varying size, from that of a large nut to that of a child's head. It is indolent, and usually entirely indurated, though it may sometimes contain one or several small central cavities, the seat of former abscesses. Again, it may be entirely covered by the skin, and appear as a large fibrinous growth at the posterior border of the ulna and, notwithstanding its dimensions, without interfering with the movements of the animal. At this stage it seems to have reached its acme, and becomes thence forward simply an unsightly, though lameless redundancy and stationary blemish.

These four forms of capped elbows may all be

present in the same animal, by forming each in its turn, the legitimate termination of its predecessor. This occurs when the œdematious form, or stage failing to be relieved by the process of resolution, passes to the phlegmonous condition and develops into an abscess, or if the inflammation is of a milder degree, ends in a cystic collection, to be finally succeeded by the establishment of the indurated tumor.

Capped elbow cannot, except in a small proportion of cases, be properly ranked with the more serious diseases of the horse. When it can be so regarded, it is in consequence of an unusually developed degree of inflammatory action which has ended in sloughing, the perforation of the skin, and burrowing suppuration. But it may otherwise become a matter of grave consideration, mainly from its disfiguring effect, which may at times become so marked and disagreeable as to require and justify a resort to severe and tedious modes of treatment for its removal, when the value of the animal is sufficient to justify that course.

The *Treatment* of capped elbow is either *preventive* or *curative*.

The cause of the lesion being the pressure or friction of the foot or shoe upon the joint, as already described, it is obvious, of course, that prevention of the injurious pressure, by hindering the animal from

assuming the sterno costal decubitus, involves also the prevention of the shoe boil.

While the education of young animals disposed to contract the habit of lying down in the position named, may in some instances accomplish the desired results, it can scarcely be expected that any important advantage can be secured by attempting to train the older victims into better voluntary habits. The most effectual preventive means must therefore be of a compulsory sort. The use of large boots, placed around the coronet and projecting beyond the heels of the shoe is one of the recommendations. Thick, soft india rubber air pads, placed over the heels, have often done well. Zundel recommends rollers of straw, tied on the fore arm above the knee and on the canon below it, in order to prevent the excessive flexion of the joint which necessarily occurs in assuming the objectionable posture. In many instances orthopedic shoeing forms the basis of treatment as when the animal is fitted with a shoe with the inside branch truncated, shorter than the other, and smoothly bevelled from its ground to the foot surface at the heel. The prevention of the trouble, or when too late for that, important aid in lessening the mischief has in many instances followed the use of one or the other of these appliances.



A common and simple means for the prevention of shoe boil, and one which we have known to be extensively employed, and attended with great advantage, is the nailing upon the floor across the width of the stall and about three feet from the manger of a square strip of wood measuring about three inches each way. It is in use in some of the largest horse establishments in the country, with largely beneficial results.

The *curative* treatment varies, correspondingly with the forms and stages of the disease.

In the œdematous form, the principal indication is to stimulate the process of resolution. To accomplish this, recourse must be had to the usual category of topical medicaments, including all the sedative prescriptions; warm formations; astringent mixtures; a paste of clay, or the acetate of lime; washes of lead, and when the swelling is painful, opium; accnite; belladonna, or camphorated mixture; and sometimes light blisters are of advantage. Puncturing is comparatively seldom useful.

When the *phlegmonous* stage has been reached the indication will be to accelerate the ripening of the abscess. Poultices would be specially effective if their application were less difficult. In lieu of them dependence must be placed on warm fomentations, perseveringly repeated, and lubrications with warm

oil, until fluctuation can be detected, and then, a *free* opening for the easy escape of the pus. The usual routine treatment may follow after that.

The *cystic* form of the hygroma must be freely opened at the beginning. If upon emptying the cavity it is found to be multilocular, the septa should be broken down by the fingers. The interior lining surface should then be irritated, either by the finger nail, or by throwing in some irritating injection, the standard article for this being the tincture of iodine. The tendency of the wound to close rapidly, which is very strong, however freely it may have been opened, is in most cases to be overcome by cauterizing deeply with a pointed iron, by this means both keeping the wound open and stimulating the disposition to suppuration. By thus transforming the cavity into a true abscess its tendency to diminish is promoted, and its final extinction facilitated. The introduction of a seton through the entire length of the tumor is preferred by some practitioners for the accomplishment of the same object.

Although these forms of treatment are often followed by the gradual and entire disappearance of the shoe-boil, we have also frequently noticed the appearance of small fibrous looking enlargements remaining, even long after the cicatrization had

become perfect and complete. Friction with iodurated iodine ointment, rendered slightly more active by the addition of a small portion of cantharides, carefully made and repeated, have in many instances removed them entirely, restored valuable animals to their original symetry and value.

When the *indurated* form has become established, and also when treatment in the other cases has proved ineffectual, in the modes already refered to, but one alternative remains. The remedy then is extirpation.

The means for the accomplishment of this indication as recommended by Peuch and Toussaint, are the knife, the thermo-cautery, the ecraseur and the simple or elastic ligature.

When the knife is the means, the careful separation of the tumor from the skin is effected with the bistoury, and its final amputation is accomplished with the knife. The accompanying hemorrhage, though considerable, seldom reaches the point of danger.

By resorting, to the thermo-cautery, after the careful isolation of the tumor, hemorrhage is avoided and the ecraseur dispensed with.

The ligature, applied over the skin, is recommended by Dickerhoff. It is a strong carbolized cord, which is placed tightly around the tumor, with an increase of the tension every second day. Peuch

and Toussaint, instead of the ordinary, prefer the elastic ligature, our experience of this method dates, as far back as thirteen years. We then applied it in a number of instances, but were not satisfied with the result. It is true that our patients were cured, but we were convinced by the large cutaneous ulcer which was left, and the time required for healing the sore, that this method possesses no advantage over the other forms of treatment. It is true that to remove a large indurated mass from the elbow will necessitate extensive incisions; that to keep the edges of the wound together will in many instances require ingenious methods of dressing, in order to prevent excessive movement of the joint, but notwithstanding all this, we have obtained the cicatrization of similar wounds, and witnessed the restoration of the horse to his ability to labor, in much less time than is required for the entire cicatrization of the wound of the skin caused by the amputation by ligature.

As a proper dressing for the wounds resulting from the operations we have been considering, Dick-erhoff recommends a mixture of tar, Egyptian ointment, empyreumatic oil and tincture of aloes. With these ingredients, thoroughly combined, a paste is to be formed of sufficient consistency to adhere to the skin which it covers and protects.

## KNEE JOINT.

## CARPITIS.

Although from a contemplation of the complicated anatomy of the *carpus*, (and the remark, from the near similarity of the two articulations, will apply equally to the hock joint), one would *a priori*, attribute to it a special liability to disease, yet the literature of *carpitis* is of very meager account. The French writers make a general division of the diseased conditions of that part of the leg by describing separately the lesions of the synovial membranes and those of the bony apparatus; while the English authors consider the subject under the simple head of *carpitis*, and they all with Percivall and Williams, refer to an excellent article published in the *Veterinarian* of 1845 by Mr. Arthur Cherry.

Our own view of the subject is that *carpitis* ought to be understood as an inflammatory condition of the entire *carpus*, including under the same name the bony, with the other true articular elements as well, such as the ligaments and the synovial membranes.--And this is evidently the idea of Mr. Cherry, when he refers to the six morbid conditions which may be met with, as classified by himself in the terms following:



“1. Simple inflammation of the ligaments of the joint;

“2. Simple inflammation of the synovial membrane;

“3. Inflammation followed by deposit of osseous matter consolidating or obliterating one or more of the lower joints of the carpus.

“4. Inflammation extending to the articular cartilages or body of the bone or bones, terminating in ulcerative absorption, accompanied with deposit of osseous matter around the diseased portion.

“5. Ulceration, absorption of synovial membrane, articular cartilage and body of the bone, either together or separately, and progressing insidiously, without showing any very marked symptom of the diseased state of the joint, and which state is considered to exist without the presence of inflammation ;

“6. Combinations of the above.

Our own observations, in the various post mortem examinations we have had the opportunity to conduct, in cases of chronic carpalis, enable us to confirm the views of Mr. Cherry. If any of our readers would more thoroughly study the subject we would recommend them to consult the photo-lithographic illustrations accompanying the text of Williams, in the second edition of his “Surgery.” They convey a very correct idea of the changes

which characterize the carpus when under conditions of disease.

All these conditions however, require time for their development, and while that process is in progress, the diagnosis of carpalis becomes a task of but little difficulty to the veterinarian. It is different, however, in respect to the acute stage. It is true that a careful examination of the suspected joint may detect a certain fullness of the articulation and a defectively defined condition of the bony prominence, or a largely increased rise of temperature, or a certain soreness on manipulation, all of which may justify a conjecture of carpalis. But all the principal symptoms must be observed while the animal is in action, or when the knee is flexed. In travelling, the leg is carried forward in a direction as straight as possible, and, as remarked by all writers, with a slight movement of circumduction. When putting the foot down, the heels are made to touch the ground first, in order to throw the greater stress of the weight of the body on the tendons of the posterior part of the joint. According to Williams, there is a disinclination to canter, and Cherry says: "There is one other point of difference; that is, in the manner of going down or up rising ground. In carpalis the lameness is increased in descending and mitigated on ascending ground."

The disease may be observed in both legs at once, but appearance in a single limb is not unusual. In the latter case, the difference in "handling" the two sides will betray the fact. The horse will take a longer step with the lame leg than with the sound one—as remarked in another place, from an instinctive inclination to keep the lame limb from the ground as long as possible. Again, when the leg is under examination by the surgeon, and is forcibly placed in extreme flexion, the difficulty of holding it in that position, and the resistance of the patient, caused by the pain to which it subjects him cannot fail to betray the existing condition of the joint.

In assigning a cause for this affection we must again refer to the catalogue of external injuries as principally instrumental in originating it, and repeat the enumeration made before. Carpalis may generally, then, be attributed to bruises, speedy cuts, and contusions received in striking the leg against the manger while pawing in the stall, and ways innumerable beside. Cherry holds that straight upright legs and short pasterns are predisposing causes, and thinks, also, that it is a matter of heredity, and suggests the point for the serious consideration of breeders.

In the first stages of the disease, when the inflammation is comparatively acute, and but little patho-

logical change has taken place, especially if the bony structure is not greatly involved, rest, local applications, cooling lotions, warm embrocations, astringents, or counter irritants of various power, with liniments or blisters, may to a certain extent relieve the patient. But if, on the contrary, changes have taken place in the bony structure, the actual cautery must be employed, and even after that, the result will depend on the degree of morbid tendency which the bones have acquired, either on their external or articular surfaces.

#### BROKEN KNEES.

The broken knee is either a deep or a superficial injury of the skin of the anterior face of the joint, resulting almost universally from falls. When the fore legs of the horse give way, either from accident or weakness, it is the knees, almost always then in a state of extreme flexion, with the skin tightly stretched over them, which first impinge upon the ground, not only while bearing the entire ordinary weight of the body, with that of the rider usually superimposed, but with the further increase of the momentum acquired by the gait of his travel, more or less rapid. Hence the frequency of wounds of this class, not only varying in gravity from a simple and slight abrasion of the epidermis to the opening

with or without loss of cutaneous substance, of one or other of the carpal joints, and more particularly of the carpo-carpals. The contributing elements which determine the degree of the wound are the rapidity of the gait at the moment of the accident, the weight borne by the animal, and the condition as to hardness and smoothness of the surface upon which the fall takes place.

Falls occurring upon macadamised roads are attended with accidents of a more serious nature than those which occur upon other roadways, either because of the lacerating character which the wounds commonly assume, in consequence of the sharp and cutting qualities of the stones composing them, or from the liability of the animal, when the road is in good and smooth condition, to slide and rub the skin, drawn tensely over the overflexed joint, making the friction the cause of more injury than would have resulted from the impingement alone.

The seriousness of this class of wounds is enhanced by the fact that, occurring under the conditions by which they are usually accompanied, the skin covering the anterior face of the knee is nearly always to a greater or less extent destroyed, and even the tendinous sheathes, the ligaments, and at times, even the bones of the carpus become also involved. Knowing thus the external conditions of



the formation of broken knees we must also consider the predisposing causes by which some animals are rendered more liable than others to the lesion in question.

Weak animals, whether feeble in consequence of excessive age or of extreme youth, or from innate lack of muscular power, or fatigued from overwork, are of course specially exposed to falls and their natural results. Bad conformations and deformities are also predisposing circumstances. and the list may be extended to include horses with sprung knees and those who stumble because of the extra length of the phalangeal joints, or from over-long feet, or bad shoeing. And withal, there are causes and conditions which need not be specified or enumerated, such as blindness, unskilled driving and poor riding.

The symptoms of broken knees vary with the depth of the injury. If superficial, they are like all similar wounds of the skin. But if the entire thickness of the skin is penetrated, and the subcutaneous cellular tissue becomes involved, the laceration may be extensive and the wound a serious one. In this case the secretion of the traumatic surface is more abundant than it ought to be, relatively to the apparent extent of the injury. It is of a sanious and albuminous appearance, and often appears as if foaming, at the edges of the wound, according as it

is forced out by the movements of the joint, both of flexion and extension. Although often mistaken for articular synovia, it usually proceeds from the open subcutaneous mucous bursa. Its escape is accompanied with no great amount of pain, while if the articular synovial membrane is involved, the pain is great and the lameness becomes excessive, neither rest or progression bringing any alleviation to the suffering. The nature of the injury is usually sufficiently obvious, but in a doubtful case, the question may be easily solved by direct exploration with either the finger or the probe. The diagnosis is then easy, but the exploration is not unattended with danger, and should be made with great caution, if at all.

When it becomes evident that the true synovial sac has been opened, it then becomes important, in reference to the question of prognosis, to ascertain whether the seat of the lesion is one of the tendons which passes in front of the knee, or one of those which belong to one of the carpal joints. The lesion in some cases is sufficiently extensive to allow the easy settlement of this point, as when the articulation is open, the bones and the articular cavities are easily recognized. But at times it is otherwise, and the wound, though sufficiently large to permit the escape of the synovia, is too small for ocular inspec-

tion. In these cases, the degree of the attendant pain becomes an important element of the case, and must be carefully studied. If the sufferings of the patient are evidently very severe, the inference will be in favor of a decision that the joint itself is the seat of injury. But if the pain is comparatively light and the patient, without much inconvenience, continues to bear a portion of his weight upon the foot, it becomes probable that the tendinous sacs alone are open.

The cicatrices remaining on the skin after broken knees sometimes form a considerable disfigurement which of course must vary according to the form and dimensions of the primitive accident. Thus, when the skin has been only superficially injured, and only the epidermis lacerated, leaving the hair bulbs intact, the marks will be insignificant and may entirely disappear. But it sometimes occurs that though the hair bulbs are not destroyed, yet their function has in some way become modified, and there is a consequent change in the color and even in the directions of the growth of the hair. And if the wound is deep, or in any case when there has been a positive loss of cutaneous substance, the cicatrization will quite certainly leave a surface entirely denuded of its hairy covering, and there will remain a whitish or blackish eschar forming an indelible

blemish and ineffacably marking the site and partly the dimensions of the injury.

Ordinary simple bruises over the knee need no special attention. Like hurts of the same degree in other parts of the body, if any curative means are used, common cooling applications will be sufficient.

When there is laceration of the skin it is desirable, in bringing the edges of the wound together, to make the coaptation as perfect as possible. This can be effected only by a nice observation of the condition of the wound when applying the necessary adhesives or bandages. The inevitable and uncontrollable motion of the parts involving the certainty of the tearing out of the stitches, and the complications which would follow the additional and aggravated injury, preclude the use of the sutures. Careful and repeated dressings are necessary, not only for the purpose of keeping the progress of the cicatrization under observation, but also in order to prevent excessive swelling, and to guard against chafing the back of the knee.

When there is a suppurating surface, the wound should be dressed with digestive ointment, or any of the ordinary carbolized compounds.

When there are open synovial tendinous or articular bursæ, and the bones and tendons are exposed perfect rest and as great a degree of immobility as it

is possible to attain, are the principal indications. For the latter purpose light splints at the back of the knee, well secured by bandages are advantageously used. The exigencies of the case must determine the subsequent steps. An escape of synovia must be treated in the same manner as an open joint, by stopping the flow with powdered bichloride of mercury or burnt alum. If there is disease of the bones, and an attack of arthritis seems imminent, the treatment which has already been indicated will again be applicable, with chances of recovery corresponding with the extent of the bony lesion.

But if the tendons which pass in front of the knee are torn the capsular ligament opened, and the bones fractured or seriously injured all expectations of recovery may be dismissed and the only humane and judicious disposition of the case becomes the destruction of the animal, without useless delay.

#### HYGROMA OF THE KNEE—CAPPED KNEE.

The front of the knee in large animals, and especially in ruminants, is the common seat of a species of tumor, the serous bursa, which forms the peculiar aspect of the affected part, and from the similarity of the attendant pathological changes, has given rise to the term of *capped knee*, a term shared in common



with the *capped elbow*, already mentioned and the *capped hock*, which still remains to be described.

To adopt the definition of Percivall, a knee may be called "capped" when it presents on the fore "part, a uniform swelling, having a soft, elastic feel, "and having so long as it be recent, more heat than "the surrounding skin, though pressure fails to "show that it is any wise or any where painful, or "even tender." It is a common affection among horses, where it is susceptible of easy cure, and of still more frequent occurrence among cows, where it is sometimes reported as appearing in an enzootic form, and may result from many causes. Contusions, however received; the pressure arising from decubital posture in animals which lie on their knees; blows, if sufficiently violent; striking the manger with the knees; the swinging of the log at the end of the holder chain against the knees of horses accustomed to pawing in the stable; the capped knee may be referred to all these, as mechanical causes, or, according to Percivall, it may have a pathological origin, as a dropsical or œdematious affection of the limb, or rheumatic inflammation of the joint.

The capped knee is a tumor of somewhat indefinite description as to its consistency, being both somewhat hard and somewhat soft, with more or less surrounding tumefaction, and neither cool to

the touch nor painful to the patient. And although from the lack of inflammatory action it cannot be said to be a cause of positive lameness, it offers an impediment to the free flexion of the joint, and in that manner causes a stiffness which occasions an irregularity in the gait of the animal; rather from a mechanical than a pathological cause.

But at times, and not unfrequently, it becomes inflamed and painful, and like the hygroma of the elbow, changes to the phlegmonous character, and ends in assuming fully the suppurative form. And again, as the cyst is usually multilocular, it may become the seat of an organized plastic exudation which at length establishes itself on the front of the knee in the shape of a fixed tumor, which though not very hard in its consistency is found exceedingly difficult to dislodge.

All these circumstances, considered with the possibility of such a termination always in reserve, it will be seen that a ready and confident prognosis in a case of capped knee is by no means a matter of easy attainment in any case, and it becomes all the less easy when a horse is the patient.

There is no necessity for hasty interference in this affection, inasmuch as the exemption of the patient from the influence of originating causes is often sufficient to insure a spontaneous recovery, without

any active medication. It still remains true, however, that the use of cooling, astringent and sedative applications, will often prove highly beneficial. Pressure by bandages or with sponges, has also given excellent results, and these failing, counter irritants, blisters, alteratives, and the actual cautery become efficacious. If the disease resists this antiphlogistic treatment, and the tumor assumes an inflammatory character, suppuration may be anticipated, and the early pointing of the abscess should be encouraged. When this takes place the escape of the pus should be assisted by a free incision and left to granulate and heal. An early date is preferred for this by some writers, while others supplement it with the seton, and others again with injections of a weak solution of tincture of iodine. The danger of causing ulceration of the sheath of the extensor tendons, suggests caution in resorting to this. The escape of the synovial fluid will reveal this complication when it occurs.

#### HYDRARTHROSIS OF THE KNEE.

#### TENDINOUS SYNOVITIS OF THE KNEE. TENDINOUS THOROUGHPIN.

The resemblance of this disease, as it affects the knee, to the same affection as found in the hock, the

thoroughpin of English writers, justifies our adoption of the same term for application to both joints alike. The tendinous thoroughpin, or hydrarthrosis of the knee is constituted by either a dropsical condition of the synovial sheaths which facilitate the sliding of the extensor tendons upon the anterior face of the knee, or by the dilatation of the carpal tendinous synovial sheath on its posterior face. The synovial sacs of the extensor tendons assist their action in gliding in the sheaths formed at the expense of the common anterior ligament of the carpus. They sometimes communicate with the articular capsules, an important peculiarity to consider in view of the danger attending their opening. The flexor tendons, as they pass through the carpal arch are surrounded by a vaginal synovial sac, which by reflecting upon the tendons forms, above and below, two cul-de-sacs, which are rendered more prominent by the occurrence of a dropsical condition of the synovial capsules. The superior cul-de-sac runs at the side of the flexor muscles, as high as the lower quarter of the radius, while the inferior surrounds the perforatus and the perforans tendons, and extends downward as far as the superior third of the metacarpus.

Hydrarthroses of the knees are situated along the tract of the tendons of both the flexors and extens

sors of the phalanges, where they constitute tumors anterior and posterior. The posterior gives rise, behind the carpus, to two tumors of unequal size, the external being much more voluminous than the internal. It is of an oval form and situated on each side, between the radius and flexor muscles of the metacarpus, nearer to the muscles than to the bone. It is more elongated superiorly, and extends downward below the knee, as an elongated mass, irregular on its surface, and somewhat bosselated according to the pressure of the anatomical structure of the region. There is considerable variation in the dimensions of these hydrarthrosis, and they possess a tendency, according to Bouley, to induration of the walls, with even a possibility of ossification.

The dilatation of the tendinous sheaths of the extensor tendons may give rise to tumors of various size, small at first, and elongated, along the course of the tendons but becoming much larger, and sometimes uniting together and communicating with the articular capsular sac. The walls usually become ossified and the cavity frequently contains floating bodies. They are distinguished by the depth at which they are found from the hygroma, which is always superficial.

In the treatment of this form of tendinous dropsy,



needle canterization is recommended, and tincture of iodine injections are of service, but this refers to the posterior tumors only, their use in those situated anteriorly being precluded by the danger of establishing communication with the articular synovial capsule. The deep or needle cauterization is without doubt, the most efficacious and lest hazardous of all modes of treatment.

The dimensions sometimes attained by posterior thorough-pin of the knee are too great to consist with the possibility, or in any case, to justify any thing like a hope of recovery. Yet a case in our own practice, in which the fore arm, the knee and the upper portion of the canon were involved, and in such a condition of deformity from the enormous dilatation of the tendinous carpal sac, as to cause much hesitation in regard to the indication most expedient to adopt, yielded to a treatment which consisted in puncturing the tumor in various places, and vigorously applying the blistering process, until the mass was reduced to dimensions so comparatively insignificant that it no longer incapacitated the patient from resuming his labors.

## SPEEDY CUT.

The reader is referred to another page for the consideration of this ailment as we consider it one of the forms of *interfering* treated among the injuries of the fetlock.

## SPRUNG KNEES.

In this defective condition of the anterior limbs the horse stands with the knee partly flexed, so that a line from the fore arm to the fetlock, instead of falling perpendicularly, forms a curve with the convexity looking forwards. Such a condition may exist in varying degrees, from that of the slightest departure from a symmetrical posture to a variation so extreme as almost to cause a disability to bear the weight of the body, and to subject the animal to constant danger of falling. Though they may be at times a congenital infirmity, they are usually the result of old age, excessive labor or hard work imposed too early on young animals; or they may result from actual disease of the articulation. An attack of arthritis, a large carpal thorough-pin, an exostosis of the carpal bones, or even disease of the lower part of the leg may by degrees, and with time become the cause of this change in the direction of the long bones of the leg, by the retraction of the fibrous cord of the flexor brachii inserted in the

aponeurosis of the radial region, as suggested by some authors, but more usually by the retraction of the flexors of the knee joint proper i. e., the external and oblique flexor metatarsi.

With sprung knees, the animal loses a great deal of solidity and strength as to the motive function, is deficient in general activity, and even becomes liable to frequent falls. The horse, more than any other animal, is subject to this infirmity, and though he may not always be entirely disabled from labor, which is compatible with slow movements, he is of course quite unfitted for rapid travelling, and especially unfitted for such a function as that of a light carriage or a saddle horse. In the last named capacity his employment would be quite inconsistent with the safety of his rider. Scarcely another infirmity, whatever congenital or acquired, so depreciates the value of the horse as this malformation.

The question of treatment for sprung knees has long been one of interest among veterinarians, and from the importance of the subject has naturally elicited a large amount of discussion, and the suggestion of a wide variety of methods for the relief of the difficulty, but for the most part, hitherto without the development of any practicable or satisfactory result. When they are the result of congenital weakness, or are brought on by labor imposed at

too early a period of life, a run in the pasture for a few months will sometimes be of service. Blisters have been recommended, especially in cases of weakness of the joints. For very young colts splints have been tried. But usually, if any relief has been secured, it has been of a mere temporary duration, and the deformity has returned with the discontinuance of the treatment for help, and the renewal of the labor of the patient.

When orthopedic appliances and shoeing prove insufficient for the remedy of the evil, the most promising means of attaining the object is the operation of tenotomy, either by the section of the band of the coraco-radialis, or better still, of the tendons of the flexor metacarpi. The first is an old operation, recommended by Solleysel and Lafosse, but which has proved unsuccessful in the hands of Delward and others. The other, usually known as carpal tenotomy, consists in the division of the tendons of the external and middle flexors of the metacarpus. It is simple in its various steps, and considering the good results which have followed it, it is somewhat remarkable that it has not been oftener performed.

Although the origin of this operation is a matter of some obscurity, it is from German writers that our knowledge of it is first derived. Dietrichs and Hering have performed it with success. Brogniez

was one of the first to put it to the test. By his method the tendons are divided transversely with a narrow bistoury, after being exposed by means of a longitudinal incision made above the trapezium. The disposition of the wound thus made, to assume the granulating process, from which trouble sometimes arose, from an indisposition to heal readily, suggested a change in the method of manipulation, and the adoption of the subcutaneous plan.

The *modus operandi* to which we give the preference over those generally recommended by Gourdon, Peuch, Toussaint and others, is very simple. The animal being thrown, on the side opposite to that of the operation, a rope is placed on the upper end of the fore arm and another at the lower end of the canon, and both are pulled in different directions, in order to hold the leg in extreme extension at the knee. The operator, who is placed in front of the knee, feels for the separation which exists between the two muscles as they are about to unite. This being found, a straight tenotomy knife is introduced from before backward about two inches above the superior border of the trapezium, through the skin and under the thickness of the oblique or middle flexor of the metacarpus. When the point of this knife is felt on the other border of the muscle, the curved tenotomy knife is introduced into the wound,



while the straight one is carefully drawn out and then the tendon is easily divided by bringing the sharp edge of the instrument across the tense tendinous fibres. This muscle being cut, about one inch nearer to the border of the bone, the pointed tenotomy knife is introduced from behind forward on the posterior border of the external flexor, under its thickness, until the point of the instrument is felt on the anterior border, when the curved instrument is again introduced, and the division of the tendons performed, as in the case of the first muscle.

A light bandage, antiseptics and rest for about three weeks is all that is necessary. No hemorrhage, but little swelling, in fact, no accident of a serious nature has as yet been recorded.

## CHAPTER IV.

### THE POSTERIOR LEG.

#### HIP JOINT.

*Diagnosis.*—The formation of an accurate diagnosis in cases of lameness which appear to implicate the hip joint is not the least of the difficulties which are incident to veterinary practice. To comprehend this implied difficulty, the complex anatomy of the joint the strength and compactness of the connecting tissues which combine to unite and consolidate the various parts of the structure; and the volume and power of the thick muscles which cover it and control its action, must all be taken into consideration. It naturally follows from the operation of the same elements that the lesions which usually become the originating causes of lameness are of rare occurrence in the hip joint proper. This fact is amply confirmed by the statement of Bouley, whose statistics, if we accept them as authentic, prove that out of every hundred cases of lameness in the posterior limbs of the horse, at least ninety are referable to

lesions of the hock. The facility with which errors of diagnosis may occur when the seat of an existing lameness is too confidently located in the hip joint, may be easily inferred from this fact.

Still, with careful observation, a true diagnosis, even if but rarely accomplished, is attainable, and especially when inflammation can be certainly indicated in the joint proper. The serious changes which accompany and characterize that condition cannot easily evade observation.

Disease of the synovial capsule, softening and disorganization of ligaments, ulceration of the cartilage, necrosis of the bones—in a word, all the lesions to which the human formation is subject, when suffering with an attack of *morbus coxarius*, may in like manner, affect the lower animals. An interesting fact in this connection is here in point. The extreme pain attending this disease in the human subject, and its disabling interference with the function of locomotion, are matters of common knowledge, and yet, we have met with a large number of cases in which this acute suffering and the accompanying excessive lameness have quite escaped observation, notwithstanding the fact that both the acetabulum and the head of the femur have been both diseased. It is only in cases where the lesions of the bones are extensive, and the articulation proper largely

involved, that a severe form of lameness exists, or great pain appears to be present.

It is not alone the joint proper that may become the seat of disease. The ligaments, the tendons of the gluteal muscles, and these muscles themselves; the bones, and especially the great trochanter, may each become the seat of lesion. Yet too often these are all comprehensively considered, and indiscriminately referred to by the single term of hip joint lameness, or sprain of the hip.

The causes which are likely to result in sprains of the hip are sliding or falling on slippery ground, when the hind legs are suddenly thrown into extreme abduction, or indeed any violent effort, accompanied by powerful muscular contraction, or laceration of the soft structures at the joint, as when an animal has been cast for an operation, and kept continuously in a strained posture; or the strain of his resistance while being placed in the stocks for a similar purpose; or his opposition to the pressure of a heavy load while descending a declivity, and the like.

Hip lameness is not uncommonly associated with rheumatic disease, and it may also occur as a symptomatic affection in distemper, in glanders, or in farcy: and it is affirmed by Percivall that "foals and calves are occasionally subject to scrofulous inflammation of the hip joint."

But although the symptoms of hip lameness are not always readily subject to distinct characterization ; and in this lies the principal difficulty of diagnosis, it is still true, as before intimated, that by a careful scrutiny of the movements of the patient, under varying circumstances of repose and activity, a true location of the seat of the lesion may, in not a few instances, be positively determined. It will, however, only be as the reward of a thorough and intelligent analysis of existing pathological phenomena.

Among the signs to be studied are these :

There is a restrain in the action of the joint in walking, and the free forward and backward motion of nature is lacking, leaving, on the contrary, a discernible hesitation and stiffness, accompanying the displacement of the thigh, and a consequent shortening of the step on the affected side. There may also, besides this, be a certain gesture of abduction, or rather a suggestion of circumduction, similar to that which may be observed in lameness of the shoulder. But inasmuch as this style of movement may also occur in association with other affections, such as enlargement of the spermatic cord, or disease of the inguinal ganglions, or of the testicles, it must be remembered that it is not pathognomonic, and that the absence of these affections must be duly



accepted as an important element of the case. This is specially to be noted in respect to the abduction movement referred to. As a fact to be duly weighed, it must be noted that this feature is not always distinctly seen while the animal is walking, and becomes, at times, conspicuous only when the gait is increased to a trot, when its discovery becomes much easier. Percivall and Williams thus allude to this circumstance : There is a *hop* and a *catch* in the movement “of the lame limb, which to the practiced eye pretty “clearly show the lameness to be in the hip. The “whole of the quarter on the lame side is elevated “with as little motion of the hip as possible ; the “other articulations being flexed with ease.” The presence of pain may also be betrayed by a movement of the leg up and down, and though it may not be of a lancinating character, it is yet sufficiently expressive of the inability of the animal to carry weight. Manipulations of the joint are not a little serviceable as a means of forming a judgement, in respect to the hip, as well as in the shoulder, though it is more difficult to produce the necessary excessive movement in the former than in the latter, and possibly, the result, even when there is an evident experience of pain, is not equally positive. Percussion over the joint, or pressure of the bones one against the other, will often, we believe, assist in

the diagnosis. Variations of temperature over the joint, and a careful comparison of the dimensions of the two sides has sometimes proved more than sufficient to fix the locality of the ailment. An examination per rectum, according to Williams, may cause a manifestation of pain from pressure on the joint. Exercise upon soft ground, involving an increased demand upon the muscular resources as compared with that upon a hard surface, where only a minimum of force is required, will easily determine whether the suspected joint is abnormally sensitive.

Atrophy of the muscles has sometimes been considered as a valuable symptom. But if this is not an unfrequent, it still is but a deceptive one. It must be born in mind that it may be in fact but the result of the non-use of the joint, arising from a state of rest induced by the presence of other lesions, existing in regions remote from the hip, as spavins, ring bones, injuries of the feet, etc.

*Prognosis.*—The prognosis of hip lameness is usually a serious one. The tenacity of the disorder and its resistance to treatment concur in rendering it liable to an increased persistency and confirmed obstinacy, greater or less, according to the special features and the extent of the lesions.

*Treatment.*—The treatment of hip lameness must be varied according to circumstances. But it must

include the essential condition of rest, which must always be as complete as can be attained, even to complete immobilization, when that is possible. Both the cold douche and the warm fomentations are recommended in the beginning of treatment, but the wiser course is to avoid the loss of time involved in these palliative expedients, and to proceed without delay to the use of more effective and reliable measures. Among the more reliable remedies are the stimulating liniments, applied with friction, such as tincture of camphor, ammoniacal liniment, oil of turpentine and tincture of cantharidis. One class of practitioners give the preference to charges and blisters varying in strength, and applied in succession, until a good effect is produced, and they claim favorable results. Caustic trochisci, rowels, setons crossing and intersecting one another, as in shoulder lameness, have also their advocates. The actual cautery, both in dots and lines, is favored by not a few, and the blemishes which follow this severe treatment, are visible in a sufficient number of recovered patients to testify to its popularity and prevalence among practitioners. The use of canterization by Professor De Nanzio, of Naples, may be mentioned, but not, as we think, with strong recommendation.

Professor Williams advises the use of a high

heeled shoe, designed to assist the parts in maintaining a position of repose. But on the contrary, the treatment of Luchow endorsed by Hertwig and Delwart, has also shown excellent results, and though we cannot truly endorse the theory upon which it is founded, we describe it as being applicable to the same form of disease in both the shoulder and hip. It will be seen at once that the plan is contrary to all generally received suggestions in respect to the treatment of lameness of the nature of that which we are considering, in favoring forced exercise and excessive motion, in common with the cold affusions of hydrotherapy. The *modus operandi*, is thus described in the "*Repertoire de Medecine Veterinaire de Belgique*:"

"Hydrotherapy has been advantageously used in  
"the treatment of shoulder lameness by a German  
"veterinarian, Luchow. This treatment, which is  
"applicable as well to hip lameness, consists in covering the animal with a hood and double blankets  
"and rubbing the diseased joint with a mixture of  
"liquor ammonia and spirits of turpentine, of each  
"one part, and camphorated alcohol and tincture of  
"soap, of each one and a half parts. The friction is  
"ended when the skin is covered with a light foam.  
"The animal is then exercised, to the *plate longe*, turning on the sound leg, and when in a profuse per-

“ spiration is returned to the stable, where notwithstanding this sweating condition, the lame joint is covered with thick compress, wet with cold water. This is changed every two hours. The last one is removed the next day. During eight days the animal, well blanketed, is walked for half an hour. As the animal improves, the gait is increased. Recovery is ordinarily complete after two or three weeks.”

There is however, another form of hydrotherapeutic treatment, which has proved more successful in both chronic and recent cases of hip lameness; it is the use of cold water, either in douches or in sprays, it is immaterial which, if only a certain degree of force accompanies the contacts.

#### STIFLE JOINT

The stifle joint, which is a very complicated apparatus, is formed by the articular surfaces of three bones, and constituting almost two distinct joints, the femoro-tibial and the femoro-patellar, all the various elements being mutually united, adapted and strengthened through the medium of inter-articular menisci, fibrous pads added to articular surfaces, with inter-articular and surrounding funicular ligaments. Although from the fact of this complication of construction it might be inferred that



injuries would be of easy and frequent occurrence at this point, yet the truth is that the literature of this subject is exceedingly meager and imperfect. That sprains and lacerations of the ligamentous attachments must occasionally occur, cannot be doubted, or that the bones and their articular surfaces must undergo the various changes naturally incident to the osseous structure when in a pathological condition, implicating the joints, of course. So much is evident from the developments of post mortem investigations in cases of inflammation and ulceration, and of bony desposites—all of which have been found, essential pathological lesions, which must necessarily have occasioned a greater or less degree of lameness. Notwithstanding all this, however, the writings of veterinary authors are nearly silent upon the subject.

The external manifestations of injuries of the stifle-joint are exceedingly obscure, although it is true that swelling of the entire joint, with an unusual heat, and perhaps soreness on lateral pressure, must naturally suggest this point, as the seat of disease. The position of the animal while at rest is corroborative of this suggestion. Standing with the limb flexed, the thigh upon the pelvis and the tibia upon the femur, it is obviously, an attitude which the animal would instinctively assume in order to

avoid the painful pressure of the bones against each other. In referring to this, Williams says : “there is then, when the animal is called to move, a peculiar condition, by which extension succeeds to this semi-flexion, which is the consequence of the rigidly extended state of the stifle, and as a result the heel of the foot strikes the ground first.”

This semi-flexion of the entire leg appears to be one of the most essential symptoms of disease of the stifle. But the motion ; the difficulty attending the flexion of the joint, with its tendency rather to the opposite condition of extension ; the occasional dragging of the toe on the ground ; sometimes the associated suggestion of a slight circumductory sweep ; and with these, soreness on pressure, with heat and swelling, readily discovered by the touch—considered together, this group of appearances furnishes quite sufficient evidence of the presence of disease of the femoro-tibial or femoro-patellar articulation.

Out of numerous post mortem examinations of the stifle joint made by us, we have in but very few instances discovered the series of lesions commonly met with in arthritis. Indeed, comparatively very few cases of lameness in this articulation, from any cause, have fallen under our practical observation, and we feel justified by a large experience, in affirm-

ing our conviction that notwithstanding the many conditions of exposure to injuries incident to its situation and its functions, such injuries or lesions are in any case of very rare occurrence. And it is our further conviction that when they are encountered, the wisest and most promising indication of treatment will be fulfilled—as we have before mentioned, in respect to the treatment of lameness generally—in long rest, with a good deal of non-interference.

## HYDRARTHROSIS OF THE STIFLE.

The motions of the joint are assisted by three synovial capsules, one pertaining to the femur and the patella, or the femoro-patellar, and two connecting the condyles of the femur and the facettes of the tibia. Although these synovial sacs do not often assume a dropsical condition, still they do at times become thus affected, and quite extensively tumefied in consequence. This assumes the form of a soft tumor on the anterior face of the stifle, in front of the patella, and is developed somewhat more inwardly than outwardly. The appearance of the tumor itself furnishes the first intimation of the existence of the lesion. If, of considerable size, this may seriously interfere with the movement of the joint, and produce a marked and troublesome lameness.

Caution must be observed in order to avoid the error of confounding this tumefied condition with an apparent enlargement sometimes observed in a healthy stifle, when the animal is seen standing in an easy position, but with the limb semi-flexed, as may occasionally take place. The flexion of the joint is very much interfered with, in hydrarthrosis, in consequence of the incompressibility of the confined liquid, and when this is the case there will be a marked peculiarity in the style of walking, the animal either dragging the leg or carrying the foot forward by a single movement to the spot where it is to be set down.

The liability of this disease to result in an enormous enlargement of the joint is among its most serious dangers. To relieve this condition resort must chiefly be had to blistering or to the cantery, the application of the latter by deep penetrating points. The puncture of the tumor with a fine trocar, followed by fine cauterization through the skin, and the application of a layer of cantharides ointment has produced advantageous results. Ointment of bichromate of potash is also advocated, though not in preference to the actual cantery.

## HYGROMA.

A large collection of this nature which came under our own observation, enables us to present an authentic description of this affection. It appeared in the form of a very large, soft, fluctuating tumor, in front and somewhat on the inside of the stifle, and of a shape somewhat elongated in its supero-inferior diameter. Though not painful to the touch, it interfered greatly with the function of locomotion, in consequence of its bulk alone. After treating it outwardly by the application of mild absorbents and the cold water douche, we decided upon more thorough measures, and proceeded to empty the tumor of its entire contents, by means of the aspirator. The result of this operation was the removal of fifty-two ounces of a thin, slightly albuminous, yellow fluid, and the sac having nearly refilled, a repetition of the puncture the day following, with the discharge of twenty-six ounces more. The trocar of the aspirator was then left in the opening, and about six ounces of a very weak aqueous solution of tincture of iodine injected into the cavity. The injected fluid was not suffered to remain in the sac, but after being brought by means of the massage process, into contact with all parts of the interior surface, was withdrawn through the trocar, by



the aspirator, in the same manner in which the original fluid was removed. Further treatment being now intermitted, the parts became the seat of a flat swelling, slightly warm and somewhat painful, until a few days subsequently, when a return of the serous collection became manifest. A third puncture, and the removal of about four ounces more of fluid, followed by a second injection of diluted tincture of iodine completed the recovery. A slight swelling which had remained disappeared after a few days and the animal was returned to his work.

#### CRAMPS OF THE PATELLAR MUSCLES.

A true luxation of the patella consists in a displacement of the bone, either inwardly or outwardly, from the femoral trochlea, and this cannot take place upon the femur, unless the ligaments which unite them are either lacerated or extremely elongated. Such a lesion would be necessarily accompanied with either swelling of the stifle, inflammation of the joint, or arthritis, and would necessitate a careful and protracted course of treatment. But these conditions are not those which characterize the case which is commonly described as a "stifle out of place."

There is however, a condition which may result in a simulated, or *pseudo* dislocation of the patella,

and is the effect of cramps of the muscles of the stifle, which produce a physiological displacement of the patella, with a corresponding lameness, and having peculiar characteristics of its own.

The experimental observations and researches of Mr. Violet have proved that this pseudo dislocation of the patella is simply the arrest and lodgement of the bone upon the upper end of the internal hip of the femoral trochlea. This part being well fitted by its peculiar formation to prevent the patella from sliding back over the rim and being drawn downwards to its normal place, then becomes fixed in its new position by the irregular and violent contractions of the muscles involved in the abnormal tension.

The main symptom to which this condition gives rise is essentially characteristic. It is a sudden rigidity of one or other of the hinder extremities, so extreme and extensive that the entire limb assumes the appearance of an inflexible bar throughout its entire length. This symptom may become manifest both in and out of the stable, either while the animal is rising up, or possibly even while he is simply in the act of moving backward and forward in his stall. When compelled to move, the act is performed without visible flexion, either at the stifle or the hock, both joints having become wholly immobilized.

In that condition, as Bouley and Nocard remark, "femur and tibia, tibia and metatarsus, form but "one single stiff rod, and so the foot cannot be "raised from the ground, the flexion of the phalanges takes place by the anterior face of the foot, "which drags on the ground, with its plantar surface turned backward, and as a consequence, the "hip is lowered in proportion."

In this condition the act of walking is accomplished only with great difficulty and by violent exertions, as the suffering animal testifies, intelligibly enough, by his anxious countenance, his dilated nostrils and his hurried respiration. On examining the stifle, a deformity soon appears, on the outside, at its superior part, in the form of a hard, resisting prominence. This is the dislocated patella. The lameness characteristic of this lesion is strictly intermittent. It disappears at once when the patellar slides back into its place, but returns immediately whenever the obstruction again interferes with the proper downward motion. It may return to its proper location by a spontaneous action, or it may require the interference of the surgeon for its reduction. In either case, however, immobility of the stifle and hock joints disappears at once, as the patella glides, back over the femur, their flexion being re-established without pain or stiffness. The

essential causes of this peculiar lesion are considered by Violet to be either the spasmodic contraction, or cramp of the inferior fibres of the internal vastus, or a paralysis, soreness, or weakness of a portion of the superficial glutens.

Whatever may be the explanation of their phenomena, their occurrence is most common in young colts, and in horses from four to five years old, and especially during convalescence after prostrated and debilitating diseases; after attacks of distemper, influenza, etc., and after excessive exertion following a long inactivity. Williams speaks of their occurrence as supervening upon attacks of indigestion, and as yielding to one or two doses of purgative medicine.

In view of the nature of some of the originating causes of patella displacement which have been referred to, the suggestion naturally presents itself, of the practicability and value of preventive measures, and one of the most important and obvious of these would seem to be suitable and continuous exercise, by which the animal would escape the danger of a sudden change from protracted rest to sudden and violent labor.

The curative treatment consists, of course, in replacing the dislocated bone from its abnormal to its normal position, and preventing, if possible, a recurrence of the luxation.

In fulfilling the first indication the leg is brought into excessive extension, either by an assistant, or with the aid of a rope, while the surgeon, placed towards the back of the animal forcibly pushes the patella forward and inward. When the luxation is successfully reduced the fact is known by a peculiar sound, accompanied by a sudden jerking of the leg, and the simultaneous flexion of the stifle and of the hock. But although, when the bone is once returned it will frequently maintain its position, the trouble may recur after walking a few steps, and the process of reduction may become necessary a second, and even a third time. The question of preventive treatment becomes, therefore, one of interest and importance. Stimulating frictions are recommended, with this view, and are practised with embrocations of various degrees of strength, from the mildest liniment to the most energetic blistering. Sometimes when the surgeon finds his manipulations over the joint insufficient, soothing medications, chloroform, and opiates over the muscles of the femur, are said to be beneficial, while again, severe showering douches, or hot fomentations have relieved when all other means had failed.

In our own experience we have always observed that good results have followed moderate exercise immediately after the reduction, and very often the



simple fact of turning the patient loose in a large box stall has been sufficient to prevent a return of the difficulty., even when the displacement had previously disappeared and returned intermittingly, while the patient was kept in a single stall.

The subcutaneous section of the internal tibio-patellar ligament has been recommended as a last resort, by Italian veterinarians, and seems to have been recognized as good practice by Professor Nocard, who states that it has been performed several times, and has been followed by complete success.

To whatever originating causes these displacements may be due, we must look in that direction for the suggestion of the reasons which offer themselves for surgical interference, when that seems to be indicated. With this view, and for the further illustration of the subject, the relation of a case which occurred in our experience, and which we reported in 1885, in the *American Veterinary Review*, may possess a value. The favorable result which followed in that special case would fully justify us in again employing the same remedial means, if the opportunity were again to present themselves. The record of the case was made by Dr. Ryder, House Surgeon of the American Veterinary College Hospital, and is as follows :

LUXATION OF THE PATELLA OF SEVERAL MONTHS STANDING.—DIVISION OF THE LONG VASTUS MUSCLE.—RECOVERY.

*Description and History.*—A brown stallion, three years old, had been in training at the Long Branch race ground, when about the middle of May he was found in his stall with his off hind leg extended backwards, unable to carry it forward, and moving with great difficulty. When the door of his stall was opened, he fell down, and it was with great difficulty that he regained his feet. A veterinarian was called who made the diagnosis of sprain of the anterior tibial muscles, and treated him for that lesion until the end of July, when the owner had him brought to the hospital in an ambulance.

*Condition at Admission.*—The animal being unable to back from the conveyance in which he was moved, was turned and led out. He was a fine looking colt, and in good condition. In walking he carried his off hind leg in excessive extension, first backward, then by a sudden movement of abduction bringing it forward without any flexion of the leg below the coxo-femoral articulation. The muscles of the anterior crural region, and especially the fascia lata, seemed to be atrophied. Those of the gluteal were much smaller on that side. As the animal arrived late in the evening he was placed in a stall and left

until the next morning for more careful examination.

On the 29th. he was with difficulty, backed, or rather, pushed back from his stall. He was in the same condition, and had not laid down during the night, the off leg was then seized by an assistant, brought well forward, and held in that position, while by manipulations and pressure upon the external face of the patellar from behind forward, the bone was felt slipping from under the hand, and with a sharp cracking sound, returned to its place. —The leg flexed suddenly, and the animal, being led forward, more freely, with perfect flexion of the stifle joint: but as soon as the pressure of the hand ceased, and the animal had made two or three steps, the same condition returned, of extentions of the limb inability to walk. —This was repeated several times with like results.—

The ordinary simple treatment of hot fomentations being considered of little advantage in a case of such standing, a severe blister was applied over the joint, extending a great distance all around. The effects of the application seemed to be, at first, satisfactory. An enormous swelling took place; the scabs of the blister formed a firm bandage, but the result was nevertheless negative. No improvement was obtained; the leg remains in the same condition,

perhaps a little worse, as it then became very difficult to obtain a temporary abduction of the dislocation, as had been done at first. Having been allowed to walk loose in a large box stall, to wait the removal of the scabs of the blister, he was on the 15th of August, returned to a single stall and hobbles where placed upon the legs of the lateral bipeds. The dislocation was again reduced, and though he was kept in that uncomfortable position for three days, still no satisfactory result was obtained.—

The case then assumed a very unfavorable aspect. The leg was becoming excessively atrophied, the animal began to loose flesh, his appetite became poor and everything seemed to indicate a failure to relieve him.

It was then that the propriety of the operation of subcutaneous myotomy suggested itself, and with the sanction of the owner was performed, on the 9th of September, by Dr. Liautard. Having been given a dose of chloral, and being kept under restraint with a twitch, a small incision was made at the lower border of the anterior part of the triceps femoris, and a curved blunt bistoury about three inches long introduced under the skin, when its sharp edge was turned on the muscle. The division of the fibres was plainly heard and when the muscle was thought to be

entirely divided, the animal was allowed to go, the patella having returned at once to its position, but to be followed again by another immediate displacement. After waiting a few days for the healing of the parts, which occurred with little suppuration, the owner was notified of the failure of the operation, but being undecided as to what course to pursue, the animal was still kept at the hospital.

On the morning of September 26th, as the groom was entering his stall to feed him, the horse made a sudden turn, slipped and fell down; he rapidly regained his feet, and was up in a moment, and when called upon to move, was found moving the leg with perfect action, walking with a firm, steady step, although occasionally betraying a slight sharp pain in the limb, but which disappeared in a few days.

After this, he was exercised every day, improving rapidly in form as well as in action, until the 14th day of October when he was discharged in his normal condition.

*Remarks*,—Is it an error, when considering this rapid and unexpected recovery, to suppose, that the division of the muscle at the time of the operation, was imperfect, but was completed by the fall of the animal, thus confirming the propriety of the operation, in cases of such long standing?



## RUPTURE OF THE FLEXOR METATARSI.

As we have before remarked, the rupture of a muscle is the result of a violent effort in which the organic fibres give way and their continuity is destroyed by a force superior to their tenacity. Though it is frequently met in some of the muscles, the flexor metatarsi, notwithstanding its powerful structure, is comparatively a common seat of this lesion. It may occur when an animal makes a violent effort to move an exceedingly heavy load to which he is harnessed, or, as we have twice witnessed it, in making a powerful struggle to avoid a sudden threatening fall. The sudden rupture of the muscular fibres under an inordinate strain is accompanied by the exhibition of symptoms too characteristic to be misinterpreted. In the words of Percivall, in relating a case of rupture of the flexor metatassi :

“ The action of the limb indicated the loss of power  
“ of that muscle, as the leg could not be bent at the hock  
“ and completely straightened behind, and he had  
“ not power of any importance before, in opposition  
“ to those antagonist organs, the gastrocnemii, behind.  
“ In some of his movements, the limb appeared quite  
“ loose about the hock, and was occasionally knocked  
“ against the other leg. On moving him about, there  
“ was a twitching up backwards of the leg at the hock,

“ and when he walked forward, it was evidently done  
‘ without the concurrence of the flexor metatarsi.  
‘ There was a soreness in front, at about six inches  
“ above the hock, and also a little higher up, and the  
“ usual tenseness and distinctness of the tendon  
“ could not be seen. There was no apparent pain of  
“ any importance.”

Williams completes the description of the symptoms by saying that when the animal is compelled to move, the leg is thrown upwards and backwards, with great violence, and at the same time the tendo-Achilles is seen to fall into a number of folds.

These extracts accurately describe the symptoms exhibited by patients suffering from this lesion. If observed while standing quietly in his stall, the animal seems to be sustaining his weight equally upon all his legs, without favoring one at the expense of the rest. But upon being compelled to move, the want of the counter motion of contraction of the gastrocnemii, the carrying backwards of the leg in extension, and the flabby condition of the tendo-Achilles easily betray the true state of the case.

The question of the exact seat of the injury, and of the precise point in the course of the muscle where the rupture is to be looked for seemed for a long time to be involved in doubt. Some have located it in the tendinous section, near the origin of the muscle, and

others have placed it, from the peculiarity of its action, in the muscular tissue proper. Our own views on this subject, which are the result of direct experimental inquiry, by which we consider that the etiology of the case has been well established, are expressed in a paper which was read before the United States Veterinary Medical Association, as far back as the year 1880, and which we here reproduce :

“ A few months ago, my friend Dr. Lockhart, took occasion to call my attention, and that of several of our colleagues to the case of a horse which presented the following peculiar symptoms. While standing quietly in his stall he stood firmly on all fours ; when moving, his off hind leg dropped ; when carrying forward, the tendo-Achilles appeared entirely relaxed ; no flexion whatever took place at the hock. There was some swelling about the hock, and some soreness on pressure. My diagnosis was made of injury of the flexor metatarsi, and I located the trouble at the lower extremity of the muscle. The animal was placed under treatment, and I believe both ends, that is, the stifle as well as the hock, received attention, and I understand that the horse recovered. I confess that at first the idea of the treatment being applied to both extremities of the muscle seemed to me quite singular.”

A few days afterwards, also through Dr. Lockhart,

I had another opportunity to see a similar case, which however was of longer standing and properly considered, in a convalescent condition. If my memory serves me rightly, he had in running away, received several superficial cuts in the tibial region, and when I saw him, he also presented much thickening in the region of the hock. His action was somewhat similar to that of the first case, but in a milder form. I believe this case also terminated in recovery.

Not long after, I encountered another case in my own practice. The patient was a large grey gelding, belonging to a malt house. Having hauled a very heavy load, he was found, on the following morning, to be unable to flex his hocks. The toe of the off hind leg dragged in walking, and the characteristic relaxation of the tendo-Achilles appeared. But in this case there was no wound, no swelling and no pain in the whole extent of the tibial region of the flexor matatarsi. The horse was simply placed in slings, and after three weeks, resumed his work, without any apparent thickening in any part of the leg.

These three cases were recorded in my note book as ruptures of the flexor metatarsi.

Quite recently I examined a black gelding, belonging to a stable keeper of this city, and found the same symptoms presented. He was also seen by Dr. Lockhart and Mr. Budd. He had received his



injury by slipping backwards while in harness. He was blistered along the tendon-Achilles, and kept in slings for seven weeks, and at the present time shows no mark whatever of his hurt.

On the 3d of April, 1880, I was called to see a large bay gelding, belonging to a brewery in this city. He had worked, up to that day, having on the day previous hauled an ordinary load, but on the morning of the day mentioned had been found in exactly the same condition with the previous case, the relaxation of the tendo-Achilles being perhaps a little more marked, as was also the difficulty of locomotion. No pain or soreness appeared throughout the whole extent of the tibial region, no swelling at the stifle, or along the muscle, or at the hock. The same diagnosis was made, of laceration of the flexor metatarsi. When called upon to treat him, the question which presented itself for my decision was "what point shall I select for my external applications—one end, and if either, which; or in the middle of the muscle?" Careful examination failed to furnish any intimation and I decided to have recourse to the same treatment which I had considered so peculiar before, and which had been followed by Dr. Lockhart. A strong blister was applied over the stifle joint, and another all around the hock, and the horse was placed in slings, and as far as possible, immobilized. After four



weeks of treatment, the blisters having produced their proper effect, and the scabs cleaned off, the animal was released from the strings, and backed of his stall. But judge of my disappointment, on discovering when he had walked a few steps that there was not the slightest improvement. The actual cautery, in fine, deep points, with severe blistering, was then resorted to, the application being made to the hock, principally in front, while a strong blister was placed over the stifle. Another month was allowed to elapse and another disappointment followed. At the beginning of the third month a third blister was applied, over the hock only, and at the end of this third term of treatment I was no further advanced toward success—my patient walked as badly as ever. I kept him a few days longer, and about one hundred days after my first visit, the patient was destroyed.

It is quite unnecessary to say that I had made up my mind to make a careful post-mortem examination. The three cases first related, with this last one, were the only ones I had seen in this country, and though each diagnosis had been correct, it had also been incomplete, and this important fact rendered the treatment uncertain. I had given directions to my assistant to have the leg severed from above the stifle, amputation to be made about the lower third of the femur, for the purpose of securing both of

the two attachments of the muscle, but through some misunderstanding, the leg was cut off, in the bone yard, at about the middle of the tibia, and thus we lost one of our opportunities, and the post-mortem was imperfect. My assistant, Dr. Coates, however, took charge of this part of the leg, and made a careful inspection of what remained of the flexor metatarsi muscle. As the result of his examination, the entire structure, with the exception of some serious exudation, proved to be healthy, both the fleshy and the tendinous portions, with all their four lower insertions, being entirely free from disease.

The literature of this subject is somewhat incomplete, and I therefore improve the occasion to-day to offer these few remarks."

Percivall, in his valuable work on lameness, mentions two cases, in one of which the patient recovered and resumed work after two months. He remarks that it "was probably due to a rupture of the flexor metatarsi muscles, or its tendon, and most likely, of the latter." The second case, after being three weeks under treatment, was pronounced to be incurable.

Professor Williams reports a case in the history of an aged horse which was not considered of sufficient value to repay treatment, and was destroyed,

and it was found at the post-mortem examination that "the flexor metatarsi was lacerated across its whole thickness: its fibres were pale, and when examined under the microscope, their transverse striæ nearly, and in some places entirely wanting thus showing that the sarcous elements were undergoing degeneration."

Gourdon, in his *Chirurgie Vétérinaire*, says that "the tendinous cord of this muscle may give after violent efforts," and again, "this affection gets well spontaneously in the majority of cases." But few observations of the seat of the rupture have been made. Bouley Jr. has seen it at a point corresponding with the middle portion of the tibia, and Gonbeaux has found it at the point of attachment in the cavity of the femur.

The *Archives Veterinaires* for May, 1880, contains an excellent synopsis of the statistics of twenty-one cases of rupture of the metatarsi. The causes are divided as follows:

In two instances it occurred while the animals were being secured in the stocks to be shod;

One occurred after a fall while being shod, and held in the usual manner;

One took place during the same operation, through the mere resistance of the man holding the foot, from the violent efforts of the horse to free himself;

Five resulted from kicking backwards and having the leg caught and held by the shaft of the wagon ;

Four were caused by falling or slipping with the leg extended backwards ;

One was occasioned by the falling of a heavy load on the lumber region, the animal having given way under the weight ;

One was due to muscular contraction arising from the resistance of the animal while being cast for an operation ;

Three cases are classed as unknown ;

In three others the etiology was incomplete.

In respect to the results of post mortem examination, Mr. Bouley Jr. found "the cord of the muscle ruptured in its totality on a level with the diaphysis of the tibia," and Mr. Gonbeaux found a rupture of the tendon common to the extensor pedis and the flexor metatarsi at its origin in the inferior cavity of the femur.

The character of the prognosis as reported was far from being serious, a notable improvement taking place in from fifteen to twenty days, and after fifty or sixty days, a complete recovery in each of the twenty-one cases recorded.

The problem of the true seat of the lesion seems still to be undetermined, though most of the writers are inclined to locate it in the tendons.

In August, 1880, we operated on an old horse by making a subcutaneous division of the tendinous cord of the flexor metatarsi and extensor pedis, just below its passage through the groove between the external and anterior tuberosities of the superior extremity of the tibia, and when he was allowed to rise to his feet, the animal presented all the manifestations which I had witnessed in all the cases I had previously seen.

Two weeks later, in experimenting further upon the same animal, an incision was made on the outside and a little in front of the tibia, the anterior extensor pedis was drawn forward, the lateral extensor of the phalanges pushed outward, the tendon of the flexor metatarsi well exposed, and a division made down to the bone at the widest and thickest portion of the fleshy part of the muscle. Some hemorrhage occurred. The wound being closed, and the animal allowed to rise, he walked away from his bed with a perfect action. The leg was carried forward without any difficulty, the hock being well flexed, and the only alteration apparent in his gait appearing on the opposite leg, which had been the seat of operation two weeks previously.

He was then returned to his bed and again thrown down on his off side, for further experiment. An incision was now made immediately above the tibio-



tarsal joint, the tendon of the anterior extensor pedis, well isolated, and the muscle divided, through its entire structure, which is at this point mostly tendinous, the two portions being here on the point of subdividing into their quadrifurcation. The animal was then allowed to rise, whereupon the characteristic symptoms became immediately manifest. He dragged his toe with much difficulty, knuckling considerably at every step; the relaxation of the tendo-Achilles seemed somewhat more marked than on the other side, where the muscular portion had been left intact, and by its unison with the tendon was able to transmit to it a portion of its power. The action of turning on the near leg, the seat of the last operation, was more difficult than on the other, the leg being carried more in adduction. Still he stands firmly on both legs, and when in the stall, appears to be in perfect health.

As the result of the observations and experiments thus detailed, we have arrived at the following conclusion:

*First*, the symptoms recorded are not due to rupture of the fleshy portion *alone* of the flexor metatarsi.

*Second*, the rupture, laceration or divison of the tendinous portion alone, at its upper part, from its origin to the point of union with the muscular fibres, may cause the difficulty of flexion at the hock.

*Third*, the rupture, or division of the lower portion of the muscle, or of any part of it where the tendinous and fleshy structures are united, may also give rise to the same symptoms, but probably more marked, and with greater difficulty of flexion at the hock, and with impaired co-ordination of the movements. \*

The prudent practitioner will always make a guarded prognosis in injuries of the flexor metatarsi, inasmuch as though many patients do recover, there will still remain a sufficient fraction to justify a reserved opinion.

The treatment is comparatively simple.

The most essential of all conditions of the reunion and repair of the divided structure, is doubtless rest and consequently, the first incident of treatment should in our judgment, be the placing of the animal in slings, and in a narrow stall, where lateral motion will be limited as much as possible. The application of blisters over the parts which the swelling seems to indicate as the seat of injury, is recommended by leading authorities, but we have our fear that the benefit that might attend their employment is likely to be more than neutralized by the movement of the limb induced by the irritation accompanying the action of the vesicant. The confinement of the leg by

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\* American Veterinary Review. 1880.

bandaging, or by putting it in splints, as in cases of fracture, is also in our view, objectionable, as being likely to be an incumbrance rather than an advantage. The forced flexion of the hock, if the repugnance of the patient to the necessary restraint could be overcome, would more than any other measure facilitate a cure by retaining the coaptation of the separated muscular fibres.

But the judgment to which we have been led by not a little experience is that in general, additional manipulations of the limb is more likely to result in injury than in benefit, and at the present time our sole reliance is uniformly placed in simple REST. And we sum up the matter by declaring that from six weeks to two months of perfect immobility has almost never failed to give us full satisfaction in cases of rupture of the flexor metatarsi.

#### THE HOCK JOINT.

The consideration of the diseased conditions which affect this complicated articulation will naturally involve a subdivision of the general subject, corresponding with the forms and names of the various lesions which will call for an examination. We shall thus refer to *spavins* as a disease of the bony structure: *blood-spavin* and *thoroughpin* as hydrarthrosis of the joint: *capped-hock* as hygroma; *curbs* as lesions

of ligaments and of the sheathes of the surrounding tendons, and *spring-halt* as a disease of which the etiology has not yet been clearly demonstrated.

## SPAVIN.

This term is usually understood to apply to the exostosis, or bony enlargement which is often found on the inner side and in front of the hock joint. But as a definition it is imperfect. For if in the present condition of our knowledge of the pathology of the hock joint, a spavin can only be considered as one of the various diseased conditions to which the hock joint is subject, other and different lesions, of the same bones may claim the same designation, and periostitis, and ulceration and ankylosis may each receive the same title, until every one of the various diseases of the joint in time becomes a spavin, with perhaps such varying qualifications as may be suggested by their nature, location, etc.

It is thus, no doubt that we have such designations as "bone" spavin, applied to the ordinary exostosis of the antero-internal portion of the hock, close to the metatarsis; of "high" spavin, or the exostosis of the lower end of the tibia, and extending perhaps to the inner malleolus, or internal tuberosity of the astragalus, described by the French under the name of "jarde"; or "outside" spavin, when the exostosis

is formed on the outside of the hock joint, on the external surface of the cuboid, the "courbe" of the French; and of "occult" spavin, or that diseased condition of the bones of the lower row of the tarsus, which are ankylosed, with possibly too small an amount of bony deposite on their surface to admit of detection by mere external examination.

The term spavin, then, must be here understood to signify any one of the various manifestations of disease of the bones of the hock, from an attack of simple periostitis to the several lesions of arthritis, articular ulceration and ankylosis. The confident location of lameness in the hock is often therefore equivalent to a prediction that sooner or later the hock will ultimately become the seat of spavin, under one or other of its various forms.

*Pathology.* Williams, in his excellent work on Surgery, says of this disease :

" Bony spavin consists of inflammation excited in the  
" cuneiform bones, or in the cuneiforms and large met-  
"atarsal, and sometimes the inner small metatarsal  
" either from concussion applied to the bones them-  
" selves, or extension of inflammation of the inter-  
"osseous ligaments, which are implicated in the  
" morbid process.... We think it may be also said,  
" from injury to the ligaments of the inner side of  
" the hock joint, which by their laceration or



“sprained condition may be accompanied by local  
“periostitis.”

And again. “The inflammation of the bones (ostitis)  
“originates in the cancellated structure of their inter-  
“ior : an exudation is gradually thrown out between  
“them and their cartilage, perverting the nutrition  
“of the latter, whereby it ulcerates and is removed,  
“leaving the exposed surfaces of the bones in contact  
“with each other, and their cancellated structures in  
“opposition thus enabling their vessels to com-  
“municate with each other, as we have found in  
“ankylosis. Concomitant with the destructive  
“process, going on in the interior of the bones, an  
“exudate is formed upon their periosteal surface,  
“extending from one diseased bone to another, bind-  
“ing them together by a band of lymph—ultimately  
“converted into bone—which locks them firmly  
“together, and prevents further motion.”

The bony tumor which constitutes a spavin may proceed from the periosteum and the cellular tissue, and is then characterised as epiphysar. It has at first only the resistance of fibrous tissue, and only assumes that of a bony structure subsequently, when the osseous material has been deposited through its substance. By maceration of a hock thus diseased the spavin is found to be formed of a sort of stalactiform deposite on the surface of the tarsal or meta-

tarsal bones, sometimes containing grooves of various depths, adapted to the reception and movement of tendons and ligaments.

In other instances the growth is parenchymatous, and proceeds from the bones themselves, and the articulations which they form become also involved in the same inflammatory process. This condition is attended with severe pain, manifested by acute lameness. In these cases, the surfaces become more reddened from the beginning, the periosteum thickens, and sooner or later, exostosis and ankylosis follow.—Among the lesions frequently encountered in the various forms of spavin, are bony deposits: an intimate union of some of the bones; alterations in the articular surfaces, which have become roughened by the ulcerative process; and a greater or less destruction of the cartilages.

*Symptoms.*—In the estimation of many, two symptoms are considered essential to the formation of a spavin, to wit, the existence of the bony deposit or exostosis, and the fact of lameness. And still either of these symptoms may be comparatively absent, without invalidating the diagnosis of spavin. We say *comparatively* absent, since the bony growth may be so slight as to be discoverable by only the closest inspection with the sound hock. And again,

the degree of lameness may be too insignificant for detection under ordinary scrutiny.

It is an observation of Percivall's that "lameness, though the ordinary, is not the necessary consequence of spavin." When present, moreover, it may be manifested under two different types, the intermittent and the continued.—And there is a peculiar manifestation accompanying the intermittent cases, in the fact that it is apt to be more marked when the animal is in, opposite conditions, and is either cold or warm. This circumstance has suggested the distinction observed by certain authors between what they denominate *chronic* and *acute* spavin.

The posture of the spavined horse, while standing still, is that of resting the foot upon the toe in such a manner as to incline the front face of the wall forward, with the fetlock and hock in semi-flexion; a position which causes the diseased leg to be carried slightly in abduction, while he frequently rests the heels upon the front of the wall of the opposite foot. If while in the stall, the animal is made to move sidewise, the movement is comparatively, easily made, if executed in the direction of the lame leg, but if made towards the opposite or sound side, the soreness is rendered more manifest, and the appearance of the lameness becomes more characteristic.

The lameness is rendered more manifest when the

animal is put in action, especially in trotting, except in excessively developed cases. The hock is affected with a certain stiffness, which is sometimes accompanied by a spasmodic flexion of the tibio-tarsal joint or spring halt, but with a more marked alternate, dropping and elevation of the hip. This stiffness is so evident that the first few steps are taken with the foot resting on the toe alone, but as motion continues, the flexibility of the joint appears to increase, until at length, almost the entire surface of the sole is brought in contact with the ground. In many animals, and especially in those in which the exostosis is the principal lesion, the stiffness and lameness abate, and often seem to disappear entirely, while they are kept in motion. But upon being brought to a standstill, and again left for a certain period without exercise, there is also a return of the stiffness and lameness, which will moreover, be more noticeable on the day following that on which the labor was performed, than immediately after ceasing from the effort. This is what is understood as a manifestation of "intermittent" lameness, after becoming cold.

But in another class of cases, in which the stiffness of the hock exist but in a trifling degree, it is only when the animal has been subjected to a certain amount of severe labor that the lameness begins to develop. But when it becomes manifest, it shows a

a confirmed tendency to increase in degree and persistency and only again disappears after another considerable period of rest and idleness. It may seem to be almost wholly subdued, but may be relied upon to renew its attack immediately upon its resumption of the exercise. We look upon these phenomena as resulting from a diseased condition of the articular surfaces, quite independently of the presence of the exostotic growth, in relation to which they furnish no proof, either affirmative or negative. It is this species of lameness which is recognised as contradistinguished from that of the previous paragraph, as the "warm" intermittent. It may also be encountered in diseases of other articulations.

There are other and special conditions of spavined hock which are said to exist without lameness. But we question the correctness of such a claim, and hold that there is always a certain degree of irregularity and defect in the motion of such a joint, which is sufficient to constitute the essential condition of lameness, even though the proofs of its existence may be so slight as to elude discovery by any but the most minute and careful scrutiny. In cases like these the comparative or apparent absence of lameness may be accounted for by the location of the morbid growth, which from its situation at the superior extremity of the metatarsus, cannot, to any



appreciable extent, involve any other bone of the joint. In this we have the true *metatarsal* spavin of Bouley, by whom it was so named in order to distinguish it from the *tarso-metatarsal* variety, which he considered as extending over both the tarsal and metatarsal bones.

We assume then, the existence of lameness, and perhaps in a very severe form, without any discernable enlargement, a condition by which the diagnosis becomes greatly embarrassed. But though embarrassing, it is not necessarily baffling to the expert veterinarian, who may still be able to detect an increase of heat, especially after labor; a degree of sensibility on the inside of the joint; and perhaps a little thickening, referable to the periostitis; all of which will furnish him with enough of symptomatic data for a satisfactory solution of the difficulty.

Another method of its discovery and recognition is a survey of the joint from each direction, forward, backward, and at the side successively, and especially if the inspection is accompanied by the delicate taxis of the educated fingers of the expert, trained in the exploration of sound and healthy joints, and readily detective of any departure from the normal contour and outline of the anatomy of the animal.

In addition to the two principal symptoms by which the lameness, due to spavin is usually made

manifest, there is another, described by Hertwig, which is of material assistance in the differential diagnosis of that cause of the lesion, as compared with others. He recommends that the foot of the diseased leg be raised and held, with the hock well extended, as in the position in which it is held by the farrier while nailing on a shoe, and that the horse be made to trot briskly immediately upon being released, when, if the spavin be present, the lameness will be so aggravated by the effort that for a short distance, the animal will travel on his three sound legs alone. This statement may be easily confirmed by an observation of the gait of spavined animals when leaving the shop of the farrier after being shod.

Atrophy of the muscles of the gluteal region is a common occurrence in old cases of spavin, and should be taken into account as one of the sequelæ of that disease, and of other varieties of lameness as well.

*Prognosis.*—Diseases of the hock joint of the character of spavin have always a serious aspect, from the futility of any just expectation of perfect recovery. Complete restoration is impossible. An exostosis once established, becomes a permanence, although it may sometimes occur that judicious palliative measures may be so far successful that the patient may be restored to a degree of convalescence

which is not incompatible with his return to his accustomed labor. Yet there always remains a condition of disease which must be accepted as fatally inconsistent with any assumed claim to a certificate of technical soundness, in the accepted sense of this term. The best result that can reasonably be hoped for in lameness of the hock due to articular disease or to occult spavin, and indeed, that which it is usually the principal desire of the surgeon to establish, is ankylosis of the joint.

*Causes.*—These may be divided into the two classes of exciting and predisposing.

Among the first, which are ordinarily of the external kind, may be enumerated violent efforts of every description. Heavy draughts, rapid work, any excessive labor or sudden strain, or any concentration of force bearing upon the joint and tending to cause a sprain or laceration of the ligaments, or to hurt the bone—any of these causes may be followed by spavin as its ultimate effect. Jumping, fast running or trotting, especially in young animals, and such accidents as sudden slipping upon smooth surfaces, may all be attended with laceration of the ligaments and inflammation of the periosteum, with their consequences.

Direct contusions from blows and kicks have been sometimes numbered among the exciting causes, but

in our judgment, considering the ordinary seat of a spavin, there is no warrant for this either in probability or fact. If a known case of spavin could be directly referred to such a cause, it would be one of a peculiarly and remarkably exceptional nature.

In respect to the predisposing causes, the most generally admitted is heredity. Though this is to some extent a contested theory, yet it finds acceptance both with the authorities on veterinary subjects, and in the ranks of the more practical horse breeders. Whether the transmitted predisposition is due to the sprained condition of the parents, or to a constitutional malformation of their hocks, of a transmissible nature, involves questions still amenable to discussion. According to Zundel, "horses with long canons, long and bended hocks, are more easily predisposed to spavin," and Williams says that "hereditary predisposition is not always due to "peculiarity of conformation, as many breeds or "families of horses with well formed hocks often "become unsound from this cause. Peculiarity of "conformation is nevertheless, not only hereditary, "but of itself a predisposing cause of spavin."

A question is often asked of young practitioners in reference to the malformed hocks to which the name of "coarse" has been applied. While it cannot be

denied that many animals with largely developed coarse hocks are quite exempt from lameness, it is nevertheless an acknowledged fact that hocks characterized by that peculiarity of conformation are not only predisposed to disease, but are already in a diseased state, and although they may appear at first quite able to perform their accustomed labor, free from any apparent irregularity of action, but a short time will elapse until their disability, caused by the extensive diseased process which is present, remands them to the category, of positively spavined horses.

Constitutional diseases, or predispositions, have in some instances found place among the alleged causes of spavin, which has thus been credited to existing diatheses of rachitism, scrofula, glanders and osteo-porosis, and the like. But the effects, in cases of this nature are not inclusive in respect to spavin alone, but include to all the developments of exostosis in common.

*Treatment.*—Probably no condition of the extremities to which lameness can be attributed has engaged the attention of empirics or encountered the ingenuity of the makers of specifics to such an extent as the one we are considering. The veterinary pharmacopia is running over with quack and other spavin cures, all of which are mere modifica-



tions and pseudo-improvements of old and established modes of treatment.

With many, even at the present time, the removal of the projection or enlargement which constitutes the spavin proper forms the principal indication of treatment, and this will account for the suggestion which sometimes meets with favor, that the best of prescriptions, the theory of extirpation being accepted, is that which involves the employment of the chisel and the saw. Our knowledge of the extent to which the lesion may attain, and the easy possibility that instead of its being a simple epiphysar-exostosis, it may be a form of disease which extends within the joint, and may involve in its complications the articular surface itself, affords sufficient argument against such an interference, and suggests ample reason for avoiding the dangers necessarily involved in the kind of surgery alluded to.

The operation of periostotomy, as practised by Profesor Sewell in the treatment of splints, either by simple subcutaneous section of the periosteum, or, as occasionally resorted to, by the introduction of setons under the skin, has many advocates. But we are compelled to say that in our own experience, this treatment has not been followed by the good results which some other authors have described.

The relief ordinarily secured, and which has

often proved to be of a permanent character, by the use of counter irritants, recommends itself to all practitioners, as evidence that the correct philosophy of treatment has not been missed. This is specially true in respect to the acute form of the disease, when the periostitis alone is present, or while the resultant exostosis is still possibly controlable. Blisters of cantharides, and the various preparations of iodine and of mercury, when prescribed in the acute stage, have many times controlled the development of the growth, and in the estimation of some practitioners, by duly exciting the absorbent action effected its removal. The potential caustics, such as the compounds of mineral acids, or corrosive sublimate, bichromate of potash, tartarized antimony etc., which form the basis of many of the patented spavin cures, should be wholly ignored in practice.

The actual cautery, or firing, as it is the oldest, we hold to be also the best adapted and most successful, judging from practical results, of all known methods of promoting recovery from this form of lameness. While many make the application in lines, we consider the most successful and satisfactory mode to be that of points, or dots. Deep cauterization, with penetrating points, needle firing, as recommended principally by French veterinarians, has

proved itself in our hands, to be an excellent means of relief. If done at all it must be done thoroughly and severely, and in many cases it may become necessary to repeat the operation. Several instances have occurred within our knowledge, in which relief was obtained only after the second, and even a third application of the iron. A combination treatment of firing and blistering, which is common amongst American veterinarians, is advantageous in preventing the possibility of extensive blemishes, although the results are not rendered less favorable by a disregard of that consideration. Our personal experience satisfies us that more real advantage would follow the use of the actual cautery, if practitioners would less frequently allow themselves to be deterred by the interference of timid owners, from resorting to it at the initial manifestation of the growth.

But while counter irritation, however produced, is known in numerous instances to be of essential advantage in relieving the lameness resulting from spavin, there is another requirement, connected with it which must in no wise be overlooked. It may even be claimed that when good results ensue upon whatever other treatment may have been, pursued or even a cure accomplished, the success has been, in fact, conditioned upon the observance of this requirement. We refer to the element of rest.

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effects of protracted and undisturbed quiet, until the necessary physiological processes in progress are completed, and the bones have become adapted to their changed condition by passive and natural motion, only to be obtained voluntarily and by moderate degrees. The unmolested freedom of the pasture will afford a genuine rest which cannot be enjoyed in the stable, either when tied up in a narrow stall, or walking around in a loose box.

These methods of treatment, with the result sought for in the ankylosis, are principally indicated when the seat of disease is in the articular surface. But there are cases which are quite beyond their scope, and in which they are contra-indicated by their mere inadequacy, if for no other cause.

Among these intractable cases are those in which the exostosis has become of extraordinary size, and the lameness is increased by the pressure caused by the over-stretched condition of the internal branch of the quadrifurcation of the tendon of the flexor metatarsi near its point of insertion to the small cuneiform bone in the inside of the hock. Here, passing over the enlargement and its periosteal covering, it can be easily detected running at the bottom of the groove which can be felt on the upper part of the tumor, In these cases the division of the tendinous band—tarsal tenotomy—has been often recommended, and



has been performed with good results. Still, although favored by Abildguard of Copenhagen, seconded by Lafosse, Mandel, Brogniez and others, it has not been uniformly successful, and as Bouley remarks, cannot be relied upon in cases of spavin complicated with anchylosis, or disease of the articular surface. The instruments necessary for the operation are a pair of scissors, a convex bistoury, forceps, a blunt curved and grooved tenaculum, and a tenotomy knife. In the operation, the patient being thrown on the side of the lame leg, and secured in such a manner as to expose the affected hock, the hair is closely cut over the course of the tendon. This is readily identified by the groove which it has made on the upper part of the tumor, which it seems to divide into two parts, a superior and an inferior. An incision about three inches in length is then made, posterior to the saphena vein, either along the line, or, as we prefer it, obliquely to the course of the tendon. This is followed by a slight capillary hemorrhage, which is easily suppressed. The dissection of the subcutaneous cellular tissue soon exposes the fibres of the tendon which are readily traced, crossing the incision of the skin, and running from before backwards and downwards. A small quantity of synovial fluid sometimes escapes upon the exposure of the tendinous band. The tenaculum, or an aneurism needle, which answers

the purpose as well, is then introduced under the tendon, which is carefully raised and divided, the division being made, if possible, at the point where it passes over the most prominent part of the exostosis and accomplished by pushing the knife along the groove of the tenaculum. The edges of the wound are then brought together by two or three stitches, and the horse is permitted to rise. The improvement is sometimes immediate, though ordinarily it is only after the laps of several days that it becomes apparent. In other cases it is not discoverable at all.

The division of the plantar nerves just above the point of the hock is another operation which has been recommended by some authors, but it has not been attended with the degree of benefit sometimes claimed for it.

#### HYDRARTHROSIS OF THE HOCK.

Under this variety of hock joint disease must be considered the dropsical condition of the articular and the tendinous synovial sacs, known also by the popular designation of *blood spavin* and *thorough-pin*. But believing that there should be a division of the latter term, and a distinction should be observed between the hydrarthrosis of the joint and that of the tendinous sac, we propose to treat the

subject under the two divisions of "articular" and "tendinous" thoroughpin.

The designation of "blood" spavin, with its synonym of "bog" spavin, is applied to a peculiar condition of the joint, in which the saphena vein acquires an unusual prominence at the point of its passage over that part of the front of the hock where the distended synovial capsule of the joint becomes almost subcutaneous.

The bog spavin is situated on the anterior and innerside of the hock, and may be described as a soft, elastic, fluctuating tumor, varying in size and consistency. Its formation is attended with symptoms of acute inflammation, such as heat and soreness, with a more or less serious degree of lameness as a sequel. In its chronic form, the changed condition of the joint, principally through its large increase in size constitutes a condition of unsoundness quite sufficient to interfere effectually with the ability of the animal to continue in the performance of his accustomed labor.

The articular thoroughpin usually accompanies the bog spavin. They both result from a dropsical collection in the tibio-tarsal synovial sac, the latter, as we have said, being found in the front, while the former occurs in the hollow of the hock, or the angle formed by the lower end of the tibia and the os calcis.

In this situation the enlargement occurs either as a single tumor, placed on one side, or possibly in the form of a double growth, having one portion on each side of the joint, that which occupies the inner side being the larger, but both comprising in fact but a single tumor, possessing the same external character with the bog spavin. There is evident inter-communication, pressure on one part producing distention in another, with common fluctuation throughout.

The tendinous thoroughpin, or dropsical condition of the tarsal sheath consists of a soft tumor of the same nature with the foregoing, having for its location the posterior part of the tibia, between that and the tendo-Achilles, and at the superior part of the hock. It is of a more elongated form, and of more varying dimensions, but is more commonly found protruding on both sides of the hock.

The general history of these affections, with their symptomatology, pathology, duration and terminations, together with the various indications of treatment adapted to each form of lesion, have been duly considered in our generalization of the subject of hydrarthrosis in preceeding pages, (201, 202), to which we refer the reader.

## HYGROMA OF THE HOCK.—CAPPED HOCK.

The formation of a soft tumor, of indefinite size, as the result of a dropsical condition of the subcutaneous sac at the point of the hock, constitutes the lesion denominated the capped hock. As with the kindred affection of capped elbow, which we have already considered, it is a hygroma of the point of the hock, and in many respects resembles its congeners of the olecranon.

The most common origin of these affections is of a traumatic nature, and they are traceable in most cases to external hurts. Bruises against a wall, or the sides of the stall, or other self-inflicted contusions by kicking in animals addicted to that fault, with other kindred causes, are usually chargeable with the injury. The peculiar posture assumed by some horses while lying down, with the hock held in extreme flexion, may often be included among the developing causes, and the same is true of horses confined in inconvenient quarters during long journeys by rail or on shipboard. It may be induced by excessive flexion of the hock from overwork in young animals; by the overworking of saddle horses; by leaping; by slipping on smooth pavements, or indeed, by any sufficiently violent strain or extra effort that may implicate the hock or the tendinous



cord belonging to it. Narrowness of the joint, defects of formation, and any weakness of structure may also be regarded as pre-disposing causes.

*Symptoms.*—The tumor is situated quite on the summit of the os calcis, and sometimes extends on both sides of the joint, in which case the hock becomes so enlarged and rounded as to present just such an appearance as it would exhibit if fitted and covered with an artificial cap—whence its designation. Being soft and painless, and susceptible of free movement in all directions, it cannot be regarded as an important hindrance to the labor of the animal, otherwise than when in extreme cases it may obstruct the perfect flexion of the joint by its consistency or its unusual bulk. But beyond such a degree of embarrassment to locomotion as may arise from this circumstance, it may be safely said that it seldom causes lameness *per se*. It is painful, with a rise of temperature, only in exceptional cases, and those of recent occurrence. In some rare instances suppuration, and even ulceration may supervene and give rise to complications which may involve serious consequences, and in a very few cases the cyst may assume a chronic character, and undergo the changes which have been considered while treating the subject of capped elbow.

*Prognosis.*—The prognosis of capped hock is not

usually a very serious one. Yet in view of the fact that it is not always tractable under treatment, and that it is liable to leave a record of its visitation in the form of a perpetual blemish and disfigurement, which may largely impair the market value of the animal, a cautious opinion will always be a safe one. The complications which have followed a course of heroic treatment in this comparatively mild disease have sometimes brought about the utter failure of a too confident favorable prognosis.

*Treatment.*—A recent case, manifested by pain and heat, but with no fluctuation in the tumor, may be dissipated by rest and the application of local sedatives. But when it betrays a tendency to become chronic, treatment of a more energetic character becomes necessary, though it is still not unusual to find it unsatisfactory. Counter irritants, artificial bandages and blisters are often recommended. Cantharidal ointment and iodurated iodide of potassa have in many instances proved signally serviceable. English veterinarians put much faith in an ointment of biniodide of mercury. Simple puncture of the tumor with a bistoury, or the discharge of its contents by means of the aspirator needle has aided many cases, especially when they have been supplemented by a vigorous blister, or accompanied by an injection of tincture of iodine, which last measure,

however, is not always unaccompanied by danger arising from the possibility of inducing severe arthritis. Opinions conflict in respect to the application of the actual cautery, and it is confidently advocated as well as earnestly opposed. In our own practice we have witnessed excellent results from the needle cautery, applied somewhat superficially, and would unhesitatingly prefer that treatment to the introduction of setons or deep punctures with the hot iron.

Prophylactic measures are recommended, and not without great propriety, by Percivall. In view of the bad habit which animals sometimes acquire, of kicking or rubbing their hocks against the partitions of their stalls, and in that manner exciting the disease, he suggests the plan of covering the partitions or the heel part of the stall with padding of some soft material, which will effectually protect the horse from such self-inflicted injury. In lieu of this means of protection and in case of its failure, he would place fetters or hobbles upon one or both extremities of the animal, and in the event of the failure of this plan, would replace it by the application of a wooden log or iron weight appended to a chain and secured above the fetlock, on the leg with which the animal performs his kicking, the idea of this contrivance originating in a theory of self-

instruction, by which the animal is supposed in the exercise of his natural sagacity to cure himself of his injurious habit by the self-inflicted punishment to which he is subjected by its indulgence.

#### CURB.

Upon the posterior border of the os calcis, and reaching from the upper extremity of that bone to the cuboid, and to the head of the external small metatarsal, is the calcaneo-metatarsal ligament, one of the means of union of the two rows of tarsal bones. This, under some peculiar circumstances of sprains, becomes the seat of the disease which from the special form and appearance which it imparts to the posterior part of the hock, is known by the name of curb. The vertical line which in a healthy joint extends from the point of the os calcis down to the fetlock, is altered, and in its place there is a bulging or prominence backwards, which may extend more or less from a little below the point of the hock down below the tarso-metatarsal articulation. In other words, a curb means a prominence situated at the back of the hock joint, varying in size from that which causes a slight deviation or convexity of the vertical line of the posterior part of the hock, to that of a well marked and conspicuous enlargement,

spreading not only from above downwards, but from without inwards.

The true causes of this lesion is subject to question and may be correctly classed among those of doubtful diagnosis. The French term, literally translated, defines it as a disease of the bony structure of the hock, on the outside of the joint. Percivall, and with him the English veterinarians, consider it to consist in a lesion of the cellular tissue, or of the annular ligament which passes over the tendons and binds them downwards, or even of the tendon itself. Our view is in accord with that of Williams, and with him, we consider the lesion to be of a ligamentous nature, having the calcaneo-metatarsal ligament for its seat. The fact cannot be ignored, however, that in some cases the tendons, the annular ligament and the surrounding cellular tissue may all alike become involved.

There can be no doubt in respect to the cause of this injury, and under the name of sprain under whatever circumstances it may generally occur, the fact of the existence of a curb can be readily understood. In one case the patient may be an animal which has been compelled to exert his strength beyond the resisting power of the ligamentous structure of the joint, as often occurs in young racing horses, in the hunter, and in the jumper. In another



case it may be the the result of a congenital deformity of the bones themselves, in which the line drawn from the point of the hock down to the fetlock curves from the perpendicular, or the animal may possess that peculiar and special description of hock already suggestively denominated "curby."

Whatsoever may be the cause, the difficulty is easy of discovery. Standing on one side of the animal, and looking at him in profile, the bulging of the back of the hock is readily detected. An inspection from this point is far preferable to that from behind, from which the change may easily be overlooked. The tumor, thus observed, presents according to its various stages of progress, all the manifestations of inflammation, from the acute symptoms of heat and soreness to the small, hard nodule, cool and painless, and having no worse character than that of a disfigurement.

The lameness which accompanies curb exists in varying degrees, according to its state of progress, as well as its form, as being acute or chronic, though not in such a mode as to form a very satisfactory criterion of its severity. In our own observation we have seen a very considerable degree of lameness, associated with a mild form of the lesion, and on the other hand, cases in which the deformity was comparatively excessive, with scarcely any perceptible

alteration in the gait of the animal, either in walking or in trotting. When the lameness exists, it may be denominated intermittent while warm : in the language of Percival, “usually, a curbed horse is too lame “to work, or is kept from work by growing lamer “every time he is made to perform it. Repose “always benefits this lameness ; exercise or exertion “always does him harm.”

*Prognosis.*—So far as the removal of the lameness is concerned, with the possibility of restoring the patient to his ability to labor, the prognosis of curb may be considered as favorable, and as a rule, the disease may be said to be amenable to treatment. But the fact that it is likely to leave a record of its existence in the form of an ineffacable blemish, which must constitute a permanent eye-sore, should always qualify a professional dictum in respect to the final termination of the case, since the suspicion of unsoundness will never cease to be predicable, while such an appearance is visible, upon that alone.

*Treatment.*—The treatment of curb varies in no essential particulars from that of other lesions of tendinous and ligamentous structures. The necessity of rest while the operative process is in progress, and the restoration of the disordered functions is in a course of accomplishment, is an obvious and

principal indication. And in respect to positive medication, topical applications of various kinds are offered, according to the predilections and the experience of practitioners. Cooling, anodyne and alterative preparations are variously recommended. Vesicants, in a variety of forms, including cantharides, and iodine with its various compounds, the potential cautery with alteratives, such as the largely used solution of corrosive sublimate in diluted alcohol, (one part to eight), with similar prescriptions, according to individual predilection, have their place in the armaments of different practitioners. With one class of operators nothing should precede or displace the actual canter. Of this class again, one portion prefer the feather or line method, while on our part, we give precedence, when we resort to the hot iron, to the fine puncture or needle style of firing, which, in our experience, yields better results of a positive kind, as well as being followed by less blemish in the sequel.

A high heeled shoe is recommended by English surgeons, both as a preventive when there is a predisposition to curb, and to horses already under treatment for the disease. Care is necessary to guard against the accident of wearing the shoe too long.

## SPRINGHALT OR STRINGHALT.

This is the designation ( the terms are used convertibly ) of the involuntary and convulsive action of one or both of the hind legs, by which the hock is suddenly flexed, with a more or less violent jerk, by the sudden and clonic contraction of the voluntary muscles, without any lesion or deformity of the affected member. With no sign of its existence while the animal is in a state of rest, it suddenly manifests itself when the act of walking takes place, as entirely an aberration of motion, by the spasmodic flexion of the hock, in which at the instance of raising the foot from the ground, it springs upward, to a greater or less height from the ground, sometimes to a degree and with a force which brings the front part of the hoof in violent contact with the abdomen, striking it at every step, and returning the foot to the ground with equal violence. The action is usually more pronounced at the period of leaving the stable, or when the horse is first moved in the morning after a night's repose. While it is commonly observed as the animal is moving in a straight line, it often becomes necessary to turn him from right to left, or from left to right, in order to obtain a free exhibition of the symptoms, which only occurs during action. In moderately developed cases, it may be so modified

by exercise as to be, if not removed, at least so abated as to escape detection after a few steps.

Though springhalt is a condition not to be overlooked while examining an animal for soundness, and may continue stationary in degree for years, there also is a class of cases which become rapidly aggravated, until the subject becomes totally unfitted for labor. This is more apt to take place when both legs are equally and simultaneously affected.

The causes in which this peculiar habit originates are admittedly unknown, though there is no lack of theories on the subject. English veterinarians seem to agree in locating it in the nervous centres, and considering the sudden flexion to be merely a resulting reflex motion. Percivall fixes its seat in the spinal marrow, a location which he says he "was first led to adopt from having observed a "broken backed horse exhibit all the characteristic "signs of springhalt, which in his case was clearly "only an accompanying symptom of the former disease." Youatt, and principally Spooner, adopted the conclusion from many post mortem examinations, that it arises from the sciatic nerve, the existence of which a careful dissection always revealed, while Professor Dick, quoted by Williams, was of opinion that "it was due to the presence of tumors in the "lateral ventricles of the brain," Williams himself,



however, classifying it under the head of choreic affection, and holding that it may in many instances be due to reflex nervous action, however that might be caused.

French veterinarians are more inclined to attribute it to disease of the bones of the hock, and for that reason have given it the name of *eparvin sec*. Erosions of the articular surfaces, principally in lines parallel with the trochlea of the astragalus, have been found by Rey, and others account for it by the presence of ulceration at the bottom of the astragalian trochlea. According to Rigot, the spring-halt of the hinder extremities is accompanied by erosions of the tibio-tarsal articular surfaces, while that of the fore leg is connected with those of the humero-radial joints. Goubaux and Barrier have found lesions in various articulations; in the femoro-tibial, in the tibio-tarsal—in all the joints of the hind leg, except the coxo-femoral; while again, nothing abnormal could be found either in the bones or their cartilages, or the muscles, tendons, aponeurosis, synovial membranes, blood vessels, or nerves. Bouley considers it but an exaggeration of a physiological fact. He says, “the hinge of the tibio-tarsal joint is so perfect, that there is something automatic in the movements which it executes; viz., that when they are once begun in the direction of

“flexion or extension, they terminate by themselves. When, for instance, the tibio-tarsal joint is half flexed, and that in consequence the astragalus corresponds to the tibia by the summit of its curve, the flexion is continued by itself on account of the inclination of the articular surfaces. In other words, when the pulley of the astragalus has passed or gone a little beyond half of its course, the movement has a tendency to continue mechanically, in one direction or in the other, only by the mechanism itself of the inclination of the surfaces upon which the sliding takes place.”

Dickerhoff considers that springhalt is due to the retraction of the aponeurosis of the tibial or of the antibrachial region, as it takes place either in the hind or the fore leg.

In Mr. Montagnac's view, the spring motion of the hock is but a manifestation of the sudden relaxation of the lower part of the extremity, accompanying an interference with the flexion of the leg as the contraction of the heels.

Whatever may be the essential nature of the lesion which gives rise to that infirmity, the place of springhalt must be consigned to the list of incurable disorders, and rational treatment can scarcely be recommended unless it is considered that some advantage may perhaps be expected from simple rest, if suffi-

ciently undisturbed and long enough continued. In one case, in which it was associated with bone spavin, Williams divided the tibial nerves, but without any resulting benefit. Boccar, Delwart and Brogniez have successfully divided the tendon of the lateral extensor of the phalanges. The operation is simple. "The animal being thrown, a small incision is made "in the skin covering the tendon, a little below the "hock and close to its union with the anterior "extensor and a bistoury introduced under the tendon, allows its entire division, and a piece of about "one inch is then cut off. Sometimes, when the "animal is allowed to get up, the springhalt still "remains for a few days after the operation. In "this case, daily exercise is necessary to break up "the abnormal adhesions which the tendon may "have formed in its course." Dickerhoff claims to "have obtained good results by the same process, but "he prefers and performs with more success "the "subcutaneous section of the branch of the aponeurosis of the leg which runs alongside of the anterior "extensor of the phalanges, and that of the terminating tendon of the lateral extensor. To perform "this operation, the animal is thrown on the opposite "side of the lame one. The leg is encircled above the "hock with a cord or elastic ligature, as a temporary "hemostatic, and also to render the aponeurosis

“ easier to reach. The operator divides the skin  
“ below the hock at the passage of the terminating  
“ tendon of the lateral extensor. A blunt tenotomy  
“ knife is then introduced over the aponeurosis,  
“ which is then cut. Then a sharp and pointed  
“ tenotome is passed under the tendon of the lateral  
“ extensor, which is divided across. When allowed  
“ to get up, the animal flexes down and carries his  
“ fetlock forward, but after a few steps rests firmly  
“ on the ground. A simple antiseptic dressing is  
“ then put on the wound.” A rest of several months  
is necessary before the animal can resume his work,

Mr. Montagnac claims to have obtained excellent results from the application of a “Watrin” shoe, which is made with little caulks on the inside of each branch of the shoe, close to the heels, upon which they rest, and which they spread.

## CHAPTER V.

### DIGITAL REGION.

The subjects to which the present chapter will be appropriated are :

*Interfering*, as a lesion of the skin or of the cellular tissue of the fetlock ;

*Splints*, *Ringbones* and *Sidebones*, as injuries of the bony structure ;

*Windgalls* and *Cystic Tumors*, as Hydrarthroses and Hygromas of the fetlock ; and

*Sprains*, or injuries of the tendons, under which title we shall consider the deformity of the metacarpal or metatarso-phalangeal joint known as *Knuckling*.

#### INTERFERING.

This is the action of the animal when, while travelling, the hoof of the moving leg of either of the biped sets, whether the anterior or the posterior, is brought in contact, more or less violently, with the opposite member, then momentarily at rest. Of course the injuries which result from this irregular



contact will vary greatly in degree with the amount of force which accompanies the stroke. Thus, when the contact is very light and the mark which follows it, is but faintly discerned, if not in fact imperceptible to the sight without careful inspection of the parts, the animal is said, merely, to *touch*—this being the first and least serious degree of the evil—and from this point there is a progression in the forms and stages of injury, until the animal is said to *cut*. Nor is this the limit of the evil, still other varieties of wound appearing as the natural results of the persistent and long continued infringement of a hard upon a soft vital structure, until that which begins as a simple superficial injury of the skin may reach the proportions of a lesion, which, unremedied, may well nigh destroy the value of an otherwise useful animal, by the extent to which his capacity for labor has become impaired.

*Etiology.*—There are of course various causes in which this condition of things may originate, and a rigid inspection is incumbent on the part of the veterinarian who would insist upon a full comprehension of his case, and who strives for the best attainable success in his encounter with an interfering patient.

The causes of interfering may be considered under the following heads.

1°. — *Weakness of the Subject.*—He may be predisposed to the habit by a constitutional lack of the muscular force necessary for the performance of the labor usually exacted from him, even while seeming to possess a perfect bodily conformation, and betraying, while inactive and at rest, no defect or irregularity of attitude or appearance. This condition is principally illustrated in animals which have suffered from long, debilitating sickness, and in others which have been overworked by being subjected to excessive and exhaustive toil either during their immature youth or after passing the maturity of their powers. Or the debility may be attributed to poor feeding, in which the natural stamina has failed to find its necessary support from the provender furnished. Or, in the same line of observation we may include excessive labor, however so rendered, or any cause, in short, which may derange the equilibrium of forces and requirements which contributes to the conservation of the elements of which the due correlation and action are expressed by the general term of “soundness.” The general result is that the action of the muscles becomes deficient, and the legs, instead of being freely thrown forward, become affected with the lateral movement of oscillation, which brings them in collision, more or less hurtfully, according to the existing degree of debility.

The same phenomenon may be the result of a pathological region. In horses which are weak in the lumbar region, or which are suffering from partial paralysis, or perhaps recovering from it, it is easy to understand the impossibility of performing the movements required by the legs in the locomotive act, with the strength, freedom and regularity which attend the actions of a strong and healthy animal.

A nearly similar, though somewhat modified action occurs in an animal suffering from severe acute lameness of one foot. But in this case it is the diseased leg which impinges upon the healthy member, and sometimes, with the effect of seriously complicating the result in both the new injuries which have thus supervened.

2°. — *Defective Conformation.* — Abnormal defects in form, characterized by narrowness of the chest or of the pelvis, must necessarily become a cause of interfering, through the undue approximation of the extremities in either or both of the bipeds. The trouble in such cases may be aggravated by the rapid movements of animals of high breeding, as in the racer, in which that peculiarity is specially apt to appear.

3°. — *Imperfection in the Direction of the Legs, and the Method of Standing.* — Normally, the various parts

of the legs, from the knee or the hock down, should follow such a direction that a vertical line drawn from the middle of the anterior face of each of the joint would divide the lower half of the leg into equal parts. But in animals whose legs are crooked, whether curving inwardly or outwardly, with the toes turned in either direction, and correspondingly causing the heels either to approach or separate, this condition does not exist. In both instances there is a reduction of the space normally provided for the free motion of the foot, either in front or behind, and interference becomes an inevitable consequence, though varying in respect to the part of the foot with which the contact is effected. Thus, when the toes are turned outwards, the inside of the heel will inflict the blow, and on the other hand, with the toe turned inwardly, that point itself or the quarter of the wall will perform the striking. This formation of the knee, sometimes also denominated "cow-knee" is occasionally complicated with another malformation, consisting in an excessive length of the phalanges, the term "long-jointed" being also applied to this class of animals. The deviations in the direction of the bony levers, and in the mode of standing, which characterize these cases, are under these circumstances, greatly increased, with a corresponding aggravation of the predisposition to interfere.



4°. — *Irregularity in the Action of the Joints.* — When the movement of an articulation, instead of taking place on the normal plane, parallel to the central axis of the body, deviates from the vertical line, the result is that all the the bony levers situated below it, are carried in the same direction, and instead of moving forwards in a straight line are inclined towards those of the opposite side. Here again, interfering is the result, in a greater or less degree, as the erroneous action of the joint is more or less marked. Horses addicted to a high knee action, or contrariwise, those whose habit it is to travel close to the ground, are equally disposed to interfere.

In these cases the disproportion existing between the length of the fore arm and that of the cannon constitutes the cause of the defect.

5°. — *Swelling of the Leg.* — A swelling existing at the lower part of the leg, whether diffuse, or limited to the region of the fetlock, and especially when the prominence is of a considerable size, must, if only for mechanical reasons, invite the lesion, and those whose joints have become in any degree deformed by chronic trouble of the kind must expect recurrences of the attack whenever circumstances become propitious.

6°. — *Condition of the Feet.* — A tendency to interfere may be looked for in feet excessive in size or irregular in shape, as when they exceed the nor.



mal standard in their weight or their transverse diameter. An increased liability to interfering may occur also when the foot is deformed by having the external quarter higher than the internal, with an inward deviation of the fetlock from this direction, and it may be looked for also from flat, broad feet, or the deformed feet of chronic laminitis.

7°.—*Shoeing*.—We must look to the shoe for the most common and influential of the predisposing causes of interfering, and may recognize it as belonging at once to the producing and predisposing elements. As a general fact any horse which is shod has his liability to interfere increased in at least one particular, by the circumstance that when the shoes have become polished and smoothed by continued friction, the feet have by the same process lost a portion of their holding power upon the ground. This is especially so on certain slippery roads and peculiar kinds of pavement, in travelling over which the animal is often compelled, in order to maintain his equilibrium, to shift and cross the feet so hastily and rapidly that blows and cuts must almost necessarily follow, inflicted by either foot upon the other, and resulting in wounds and injuries of a serious and painful character.

Excessive length in a foot, with its proportionally increased weight and that of the shoe superadded,

may be included with the predisposing causes, since the elongation of the foot is necessarily and naturally associated with that of the lever power represented by the phalanges, there constituting together an irregularity of action which cannot otherwise than result in interfering. But when the injurious effect of shoeing in this respect is most fully realized, it is when the shoe has been improperly fitted or the hoof improperly pared. The shoes which cause trouble are those which are too wide; those in which the heel of the inside is too long or too prominent; those which are too heavy; those in which the nails have been left too long and too prominent: or where the quarters of the wall are uneven, one being higher than the other—all of which are points and suggestions of too great pertinence and too much importance to be allowed to escape the most careful and through examination.

*Symptoms.*—The symptoms characteristic of interfering vary with the violence and duration of the originating cause. If the animal simply “touches” himself there will be no other evidence than a slight deviation in the direction of the hair covering the spot where the touch has occurred, or perhaps a trifling mark of dirt or mud. In injuries of a severer character the regions may become the seat of infiltration, more or less circumscribed, with heat and

pain, the trouble passing off, however, unless there should be a renewal of the cause, but under its repetition and continuance, forming a wound of varying depth and extent, proportioned to the amount of violence inflicted. The lesion may be a mere superficial excoriation; a cut through the dermis of the skin, or even penetrating beyond it, especially if the aggressive spot or point be hard or sharp. The violence with which the impinging body strikes will of course determine the severity of the wounds which it inflicts

The fore leg at any point from the coronet to the knee, may become the seat of this lesion, but in the hinder legs, the danger is principally confined to the region of the fetlock. Once established, they may then assume any degree of severity, and range from a simple excoriation of the skin to a pronounced exhibition of gangrene, with the accompanying access of serious infiltration, diffused purulent accumulation, the sloughing of large portions of skin or extensive plastic exudations which, in the form of callous, establish a permanent deformity on the inside of the fetlock.

The lameness which accompanies interfering varies greatly in degree, and it may occur suddenly and under embarrassing circumstances, as when the animal, while working or travelling suffers a sudden

pang which causes instantly to halt him or to hop on three legs for several steps, or until the pain vanishes. This is a frequent occurrence on our city pavements and especially so among horses working on the, street railroads.

There are cases in which the lameness seems to be suspended until the return of the horse to the stable, the inflammatory process appearing to wait until then before developing its activity. It may thus be of an intermittent or occasional character, or if it be continuous, it will be because of the repetition of the contusions and the maintained severity of the lesion. In whatever degree of severity the result of interfering may be manifested, the seat and character of the lesion are too specific in their nature and history to admit of a doubt as to their identity and their cause.

But while the point upon which the impinging force falls may always be easily recognized, it is at once more difficult and more important to determine with accuracy just the aggressive point from which the blow comes—the spot which actively hits the readily seen other spot which is passively smitten for upon this knowledge depends the decision upon the proper indications of the treatment which is to cure or palliate the too obvious evil. A careful scrutiny of the direction of the legs will often assist the surgeon in this, but he will frequently encounter

cases in which a resort to artificial tests will be necessary in order to secure a solution of the problem. At this point he will obtain good results by covering the striking foot with substances which will not only leave a mark upon the opposite leg, but receive another in exchange, thus by a reciprocal betrayal discovering both needed facts at once. An effectual method of securing a satisfactory diagnosis may thus be secured by smearing the foot with tar, or grease and chalk, in this mode, discovering by a single process both from whence the blow comes and where it falls.

*Prognosis.*—In considering the injury under discussion, and the various causes to which it may be referred, it becomes obvious that the question of prognosis is one that must receive various solutions. The same remark is true upon the point of the indications of treatment. In a case in which the trouble is due to a temporary weakness, which time and good care are adequate to relieve, the prognosis need not be a serious one. But if the origin of the evil is found in a malformation of the legs, or indeed a malformation of any part, a correct prognosis can only be reached as the result of the critical and skillful investigation of each case on its own merits by the accomplished veterinarian, and all the more, as it will be all the more important, if the case should



involve the danger and possibility of complications which may comprehend chronic lesions of a serious character.

*Treatment.*—The indications for the curative treatment of the various lesions which are observable in connection with the vice of interfering are readily appreciable, and must vary in accordance with the special manifestations pertaining to each case as it occurs, whether it be of simple contusion, diffused inflammation, purulent collection, cutaneous slough, or chronic plastic exudation. In their general scope they consist in allaying inflammatory action, facilitating the suppurative process, accelerating the separation of mortified skin, and the cicatrization of the remaining wound, or in stimulating the absorption of the plastic organization which may follow.

But the most important part of the treatment in any case of interfering is preeminently the prophylactic, and the means of preventing, removing, or diminishing the existing tendency to the habit must therefore rest essentially upon our knowledge of the causes which originate the trouble.

In well formed horses interfering can only be the result of a condition of debility. The indications in such a case is to treat them leniently, or rather justly respect to their burdens, by carefully avoiding the imposition of exactions which may overtax their

strength, and by apportioning liberal rations of nourishing fodder to maintain their stamina and spirit. Then due provision should be made for the protection of the legs by suitable pads, boots and bandages; and the most studied and careful attention should be bestowed on the shoeing, in doing which special caution should be exercised in order to avoid any disturbance of the equilibrium and symetry, and consequent bearing and general condition of the joints and ligaments. And it may show wisdom, not a little, to avoid recourse to some of the extraordinary mode of shoeing sometimes "certified" for their wonders of performance—which, however, may occasionally have their value in cases belonging to another category. More frequent shoeing, the careful paring of the hoof, and a judicious shortening of the foot will be of advantage, so long as there is no impairment of the conformation of the foot. A flat, smooth shoe, with the internal branch not beyond the quarter, and the heel even resting a little inside of it, will often meet and fully satisfy the existing requirements.

When the interfering is caused by a defective conformation of the trunk and of the legs, the question to be solved is how to keep the legs sufficiently separated one from another to escape the contact which constitutes the trouble, According

to Bouley, there are two ways of accomplishing this. The first is to give to the articular levers of the region which receives the blow a direction contrary, to that which approximates it to the part which inflicts it. The second is to render the blow as little harmful as possible, a result which can be obtained either by diminishing the thickness of the part with which it strikes, or in conferring upon the leg to which this belongs, when it enters into action a diverging movement which will carry it from rather than towards, the wounded member. It must not be forgotten that an exceedingly minute lack of space is sufficient to render the injurious contact possible, while the narrowest space for a miss is in like manner sufficient to obviate the danger—it is the “miss-and-mile” proverb exemplified.

Shoes of two patterns, quite differing in their forms are recommended. One gives an obliquity to the foot from above downwards, and from within outwards the other, on the contrary, has the obliquity from without inwards. In the first mode, the foot is pared in such a manner that the internal quarter is more elevated than the external, and the shoe has the inner branch thicker than the outer. At the same time, the prominence of the internal circumference of the quarter is reduced by the rasp towards the point which strikes, while the internal branch is

placed a little on the inside of the external contour of the wall. In Zundel's opinion, this is probably the most important part of the preparation of the foot, and must be carefully and skilfully performed, with reference to the part of the wall with which the animal interferes, careful examination being required in order to determine whether the interference occurs at the inside toe, the quarter or the heel of the foot, these being the points at which the changes in the thickness of the shoe must be made. In the second method, which is recommended by Garsault, Lafosse, Moorcroft, and others, the reduction by paring, and the changes in the thickness of the shoe are affected on the outside, with the rasping on the inside of the wall.

There are, however, conditions of interfering which are not amenable to prevention by any methods of shoeing. The indication in such cases is to have recourse to the use of suitable pads, or boots, and of these the variety and quality are great and variable. It is needless to say that when any of these are used, there must be a careful experimental adjustment in each individual case.

#### SPLINTS.

A splint is an exostosis, developing in the metacarpal or metatarsal region, usually upon the inner

side and upon the fore leg, but also occurring, though rarely, on the outer side and upon the hinder leg. Percivall designates them as the *simple* and the *double*, the former consisting in a small tumor, situated along the cannon bone, at the point of articulation with the small peroneus, and the latter, also known as the *pegged*, being formed by two projections, one on the inside of the leg, and directly corresponding with it another on the outside, as if pinned or pegged together. The splint is also called a *fusée*, when two similar growths are united at the ends, one above the other. While it is usually encountered in the middle region of the cannon bone, the splint may also be found in close proximity with the knee joint, in which case they are more or less likely to interfere with the free action of the carpo-metacarpal articulation.

Occupying the lateral part of the middle metacarpus, where its situation precludes it from any material interference with the action of the leg, the simple splint does not usually become an evil of very serious magnitude. The pegged splint is, however, less innocent in its possible effects, since it is not uncommon to find it united with exostosis on the posterior part of the metacarpal bone, and hence involving the danger of interference with the function of the suspensory ligament. The most dangerous



condition of the splint is that which arises from its location, when that is near enough to the knee joint to involve possible interference, by its own development, with the freedom of that articulation.

While the general causes of exostosis may be referred to, in accounting for the existence of splints, there is one which is probably oftener effective than any other, in the irritation which may take place in the inter-articular fibro cartilage which unites the articular surfaces of the small and large cannon bones. This irritation is a condition specially likely to occur in young and undeveloped animals, as the result of undue labor and violent exercise, particularly when the stress falls on the inside of the leg, and in general whenever the strength has been overtaxed and the vital resources are prematurely reduced.

*Diagnosis.*—There is little, if any, difficulty attending the diagnosis of an ordinary case of this nature, where the sensible phenomena are few and so obvious.

The splint is a hard, painless tumor of the middle metacarpus, varying as to size and prominence. When not visible to the eye under ordinary observation, it may be detected by tracing its course with the finger tips longitudinally along the bone, where it may be distinguished as a simple eminence or irregularity. In this stage of its progress it seldom

causes lameness, except possibly by some peculiarity of situation, and little if any apprehension need be felt of injurious consequences from its existence. But prior to the development of the osseous formation, and while the acute periostitis alone exists, the diagnosis may be attended with some degree of difficulty, although the inflammatory manifestations of heat and soreness on pressure may, from the first, suggest a correct suspicion of the truth to the expert and experienced veterinarian. The lameness itself may be present in fact, as the accompanying result of the acute process in progress, existing there, as we believe, in the intermittent form. It is then perhaps that it is most easily detected, when in the warm stage, though again we have also observed it when cold, possibly from the fact that in this case the bony deposit had begun its formation.

*Prognosis.*—However this may be, the prognosis of splints is not a serious one, since the worst consequence that can usually follow will be a blemish which may do no harm beyond offending the eye; and it is only under very exceptional circumstances that the services of the surgeon are likely to be demanded.

*Treatment.*—The treatment indicated for splints is that which, on general principles, is applicable to other exostosis. Local topics, anodyne and sedative ;

alteratives and counter irritants; all have their advocates, and all modes of treatment may be followed by satisfactory results. Excision and removal by the saw and chisel is recommended by some, and English veterinarians consider that periostotomy is often advantageous.

#### RINGBONES AND SIDEBONES.

Ringbones and Sidebones are the *formes* of the French and the *leiste* of the Germans, by which terms they describe a bony tumor which developes in the phalanges of the horse at the coronet region. They may be exostosis of the os suffraginis; or the os coronæ; or of the os pedis, or its cartilages, the name of *sidebone* being principally applied to this last form; while that of *ringbone* is always limited to the periostitis with bony deposits of the phalanges proper. At whatever point it may be established; and it is immaterial as to which of the phalanges may be its seat; when the complete period of its ossification has been accomplished, its existence will be betrayed by the tumefaction of the region, more or less developed according to the dimensions of the growth. It is rendered more discernible by the eye in some situations than in others, not only by its size, but by the greater or less degree of thickening of the skin covering it. It may be deter-

mined both by contrasting its form with the normal outline of the affected limb, and by a comparison of that with the unaffected member. Tested by the taxis, it presents a tumor of varying size and form, and of hard consistency, having all the characteristic hardness of the bony substance proper. It is situated on the surface of the bone, or near the articular surfaces, passing under the tendons, or in the interior of the horny box. When located in the cartilage of the os pedis, and its calcification has been completed it is detected by a certain bulging of the region, accompanied by a loss of its proper flexibility, which has become exchanged for an inelastic hardness, and yet keeping the peculiar form of the characteristic cartilages. But however easy it may be to decide a case in which the ringbone or sidebone has completed its formation, it is a task of quite a different nature to certify the fact with accuracy while the diseased process is yet in its first or formative stage. For, while the surgeon, guided perhaps by the presence of a little tumefaction, or a degree of soreness or pressure, with more or less heat adjacent and surrounding, may easily fix upon the coronet as the seat of the lameness, these appearances do not constitute sufficient data to determine conclusively whether the trouble which he has encountered is an acute and local periostitis, or some other, and undefined injury

of some other part of the complicated anatomical structure of the region involved. Under these circumstances, the surgeon may derive important aid from his observation of the pain and its characteristics, as is sometimes manifested by the patient while under examination. If the trouble exists under the extensor tendon, this is exhibited when pressure is applied to the top of the foot, over the region of the cartilages, or by the forced flexion of the foot. On the contrary, if its seat is under the flexors, or possibly under the ligaments, it will be excited by excessive extension.

The lameness in these cases varies in character in different stages of the disease. In the beginning, while only the periostitis, and the deposite of bony matter is in progress, it is either not always present or it is not yet discernible. It may also happen that the morbid process may still be accomprnied by a degree of lameness more or less marked, notwithstanding the fact of its being undiscovered and apparently undiscoverable.

It has also something of an intermittent character attending it, and is generally more marked after the animal has been subjected to labor, having for this reason been mistaken, at times, for a case of articular disease, such as navicularthrititis. But when the bony deposite has become established, the lameness which



is the result is both continuous in its nature, and distinctly manifest, and more generally intermittent in its cold condition, or when the animal is first put to work. It often occurs, too, that the pain is less the result of the inherent disorder present than of mechanical causes, as when the bony deposit interferes with the play of the tendons or ligaments, or, which is the more common case, with the motion of the joint, when it approaches too near the articular surface. In these peculiar cases, a serious complication may in time be brought on by the retraction of the tendons, and the resulting inability of the foot to perform properly its normal function of standing squarely on the flat sole. As a consequence of this there will be atrophy of the frog, with an abnormal elevation of the heels, with a distorted condition.

*Prognosis.*—The prognosis of these peculiar affections is always a serious one, since, although they do not invariably incapacitate the patient from labor, they quite frequently have that effect in utter defiance of any form of treatment within the scope of surgical skill. Nor is the size of the growth always the true measure of the severity of a case. It may happen that a larger tumor may interfere less with the motion of a joint than one of smaller dimensions, which is more acutely sensitive or has found a more unfortunate lodgment.

A more serious forecast should be given in respect to animals requiring activity and quickness of motion than for those employed in labor of the opposite kind. With the latter, indeed, a moderate degree of lameness does not appear to be a disqualification from heavy draught work.

*Etiology.*— Among the more frequent causes of this form of exostosis are to be reckoned blows and bruises, with other kinds of external injury, which have been followed in their order, by phlegmonous inflammation, abscess, and as consequence by periostitis. The bruises of the cartilages are commonly followed by chondritis, and this ends in calcification of this fibro-cartilage; and as in fact, this peculiar tissue possesses a natural tendency to this alternative process, it becomes easily obvious that but a slight inflammatory impulse will be needed in order to establish the change.

Pressure, sprains of the ligaments and tendons, and their laceration from their periosteal attachments, as they are commonly suffered from badly paved streets and rough roads, and slippery tracks, are more commonly accompanied by first, a local phalangeal periostitis, and subsequently, by the ringbone or bony deposit, of slow growth. The exposure, if not the easier liability of young animals to these injuries is greater than that in older ones—

a fact aptly illustrated by their frequency among the colts designed and put under training for the race tract—and short jointed animals may be added to the same list from the fact of the more vertical direction of the phalanges, which renders them more apt to receive the concussions of locomotion or the weight of the body more directly than if the obliquity of the bones had been more marked.

These exostosis are frequently among the consequences of arthritis in one or other of the phalangeal joints, or they may appear as the sequelæ of traumatic lesions of the foot, such as cartilaginous quittor, complicated toe or quarter crack, suppurative corn, or punctured wounds of the foot. It is our belief that navicular disease is very commonly associated with exostosis of the phalanges, though during life it very often escapes observation. They are also among the sequelæ of lesions of the bones, fractures of the phalanges being always complicated by the development of ringbones, without reference to the point where the fracture has been, with or without displacement.

While refering to the causes of ringbone, that of heredity, unquestioningly admitted into the category by old hippiatrics, must not be overlooked. And while the influence of this cause may have been unduly exaggerated, our own observation of the

transmissibility of this and other qualities, through the natural generation channels have at least brought us to a conviction of the wisdom and policy of excluding animals affected with ringbone from the stud.

Some German authors have strongly advocated the exclusion of drinking water containing an undue proportion of calcareous elements, as part of the prophylaxy of the case, but opinions are not yet settled upon the point thus suggested.

*Treatment.*—The discovery of periostitis of the phalanges, when established beyond a doubt, should be promptly followed by active treatment, comprehending local applications, such as cold bandages, and anodyne and sedative embrocations, such as a mixture of tincture of aconite and iodine in equal parts, applied by means of compresses. An active soreness is often relieved by these and kindred measures and appliances. But in our own view, and our conviction has become established by long experience, the actual cautery offers the most satisfactory of known means for checking the formation of the bony deposits, and possibly promoting the absorption of such as have already formed. The application of cauterization in points, and principally the needle method has in our hands proved most of any successful. The danger of extensive sloughing of the skin, apprehended by Zundel, is an exaggerated

one, and is a complication which in a large practice of many years we have not yet encountered. But as in other exostosis of joints, in bone spavin, for example a single firing may not in every instance prove sufficient, and a repetition may become necessary after an interval of four or five weeks from the first firing. Many practitioners recommend counter irritation by cantharides, or with preparations of iodine or mercury. This treatment offers at least the advantage of facility of repetition, and of avoiding subsequent visible blemishes, which the hot iron cannot always promise. The operation of periostotomy can be regarded with but little satisfaction, being certainly often useless, and at times involving great danger to the patient.

The extirpation of the sidebone may sometimes be undertaken with advantage, but the operation is not without danger, and must be recommended with caution, except when with calcification, there is also necrosis of the cartilage. When performed it will be the same complicated, operation of removal which is practiced in cases of quittor.

When the lameness resists, every other form of treatment, the operation of neurotomy may be advantageously resorted to. This subject has recently awakened an interest among contemporary French writers, and both the value of the operation itself



and the question of the *modus operandi* have been largely discussed, the contention principally referring to the comparative merits of the high operation and the low. We have ourselves given a large amount of study personally to the subject and have operated very frequently, and we have always practised the high operation in preference to the other mode. The result has been, in our hands, very generally successful, and as regards the frequent complications which by some practitioners are accounted so many objections to this treatment, we have had the good fortune entirely to escape them. We have operated on both sides of the fetlock, and on that point, must wholly dissent from the opinion of that class of practitioners who insist upon the necessity of an interval of six weeks between the several operations on either side. It is quite true, however, that a certain interval of rest between the operations is always of advantage to the patient when more than one leg is to be operated.

#### HYDRARTHROSIS.

#### WINDGALLS.

The fetlock joint and the synovial surface which assist in the gliding of the flexor tendons upon the sesamoid pulley have a tendency to become the seat of certain abnormal dilatations, known as *windgalls*, which are further described as *articular* or *tendinous*,

with reference to their situation within the articular or the tendinous synovial sac.

When the synovia contained in the capsules of the metacarpo or metatarso-phalangeal joints is secreted in an abnormal quantity the excessive secretion becomes the cause of certain tumors, quite uniform in their situation. Strongly confined in front of the joint by the capsular, and on its side by the lateral ligaments, the synovial sac can only expand on the posterior part of the joint, between the posterior face of the cannon bone, and the anterior face of the suspensory ligament, where it extends its superior cul de sac; or below the great sesamoids, between the posterior face of the os suffraginis and the middle inferior sesamoid ligament. It is in these two directions that the excess of the synovial fluid accumulates, and expands each cul de sac, as it is formed by the synovial capsules. By the principle of their formation; these projections, formed by the distended sacs, are only accurately defined as they extend above the sesamoids to the border of the cannon bone and behind the prominent branches of the suspensory ligament. They then appear under the form of small tumors, tense and elastic when the leg is at rest and the synovia pushed backwards, but soft and reducible under pressure when the foot is raised and the fetlock flexed.

With time these tumors may enlarge until they attain the dimensions of a hen's egg. Sometimes they will acquire a more or less bosselated surface, on account of the uneven resistance of the walls of the cavity which determines their shape. And as they extend upwards sufficiently, between the bone and the suspensory ligament in front of which they are situated, they will continue to contract in size with the lessening space which contains them.

As they reach a degree of development which indicates that they have become filled to the limit of the capacity of their cavity, the inferior cul de sac of the capsule, which has a tendency to form a hernia below the sesamoids, exhibits, behind the first phalanx, at the side of the middle and superficial inferior sesamoid ligaments hard nodosities, very tense when the foot is at rest, but also easily reducible when it is flexed.

With age, a pathological change takes place in the articular windgall, and it assumes a fibrous texture, through the exudation of plastic lymph in its meshes, and subsequently becomes infiltrated with calcareous deposits, when it is distinguished as an *indurated windgall*.

The synovial capsule of the fetlock cannot long continue subject to these various degrees of pressure without exhibiting some alteration in the symmetry

of the articular levers, and they do in fact, in due time after undergoing the necessary amount of continuous force, succumb to the slow operation of the aggressive violence, and yield the evidence of its effects in a greater or less degree of change of direction of the joint. The mode of deviation which this persevering pressure of the incompressible fluid finally effects is that which has a tendency to straighten them on each other, and, as a consequence, we are presented with a case of the first degree of knuckling.

In the tendinous windgall it is the synovial bursæ of the flexor tendons which acquires this abnormal dilatation and exaggerated fullness, the tendinous capsule being larger than the articular, as well as less restrained by its surrounding tissues, the tumors which result from its distention being therefore of correspondingly greater size than those of the articular variety. They reach their greatest development above the sesamoids, where the capsule is least protected. They first appear as small, soft tumors, elongated in the direction of the tendons, and a little outwards from the tendon of the deep flexor of the phalanges, immediately above the sesamoids, and as they develop, they extend upwards, projecting more and more outwardly, with increasing power of resistance to pressure, and



extending backwards over the tendons, as if about to envelope them. When the synovial bursæ, at a later period, has reached their maximum distention, they assume the form of quite prominent oval tumors, which offer considerable resistance to pressure when the foot is on the ground; the surface is irregular, and surrounding both the tendons, they extend from the button of the small cannon bone, a point beyond which they seldom pass to downwards, when they extend to the sesamoid pulley, where the aponeurosis, which bounds the flexor tendons, binds them firmly and apparently separates them from the inferior tendinous windgalls, of which they are in fact but the continuity, the synovial bursæ obviously extending to the os coronæ.

The tendinous windgalls never assume dimensions below the sesamoids equal to those which they possess at the sesamoid cul de sac, being prevented by the aponeurotic apparatus surrounding the tendons and the phalanges. But there are two points, immediately below the sesamoids, where a diminution of resistance permits a certain dilatation of the bursæ, and here their appearance becomes altered to that of two small, softish tumors, more easily detected by the touch than by the eye, and communicating with the superior sesamoid tendinous windgalls.



This class of tumor assumes at times a condition of induration, but is subject to this change only above the sesamoids, and like the articular dilations, it also possesses a tendency to impair the symmetry of the parts, though not to the same extent.

A hydrarthrosis of the fetlock is rarely in itself a direct cause of lameness, and it can only become so through the mechanical obstruction which the tumor offers to the free action of the joint, or when its functions are interfered with by some pathological change of structure. Or again, when the joint has become the seat of a recent acute inflammatory attack, to be diagnosticated in the usual way by rise of temperature of the parts and other evidences of tenderness and pain, to be detected by pressure.

The causes of the hydrarthrosis itself may be again enumerated, like those of most of the articular lesions of a similar kind, as excessive labor, violent exertions, slipping or other misstepping, wrenching the joint, etc. Lameness or other disability in one leg may also cause it, indirectly, in the sound one, by throwing upon the latter a disproportionate share of labor. And probably a predisposing habit may have its influence in lymphatic subjects, or in animals reared in overdamp and marshy grounds.

According to some authors, the disappearance of

a windgall may be sometimes looked for as the result of rest, the resolution of all the symptoms, and the absorption of the excessive synovial secretion. But their most common termination, in fact, is the attainment of a permanent chronic form, with the exhibition, during the remaining life of the patient, of all the concomitant symptoms and characteristics attendant on the case, and unaffected by the consideration of any changes of structure in the affected region, which, if present, exists only as independent phenomena.

*Prognosis.*—When the most serious effect of a windgall is to constitute a disfigurement in the limb of the affected animal, without materially interfering with his power to labor, the prognosis cannot be of a very serious character. But we must except from so lenitive a judgment the cases which involve certain peculiar conditions of mechanical interference with the free motion of the joint, and we must emphasize the unfavorable view which a large experience has compelled us to adopt, and to repeat the opinion that their removal is very seldom successfully accomplished, except under special circumstances, and by a very special form of treatment yet to occupy our attention.

*Treatment.*—In view of the fact that peculiar hygienic conditions have, admittedly, an important

causative connection with the origin of these dropsies of the synovial sacs, the indications in respect to the prophylactic portion of the subject at once suggests the question of better breeding, with the study and adaption, and change, when necessary, of climate; the quality of the food and drinking water; the kind and amount of labor, with reference to strength, age and build (a most important study); and briefly, all the conditions and requisites of sound and healthy conception, vitality and growth.

In respect to curative treatment, pressure, probably because of the facility with which the means can be applied, is the method most popularly and frequently employed. And it cannot be doubted that the application of bandages of various forms has in many instances proved, if not positively curative, at least largely palliative: if it has not extirpated the disease, it has at least retarded its progress and checked its indefinite increase. Local applications, when the parts are in an inflammatory condition, consisting of astrigent and stimulating frictions, counter irritation with blisters of cantharides, or alteratives of iodine and mercury—all these have their advocates and are largely employed. We have already said, in reference to the treatment of other joints similarly affected, that we prefer the early use of the actual cautery, and we repeat our conviction. In some cases firing

in lines, and in others the method by points, or with the needle iron, will secure the best results, and most efficiently correct the growth and remove the lameness.

A simple puncture with the bistoury or the trocar, either subcutaneously or directly through the skin, the puncture and emptying of the sac, followed by the injection of a weak solution of tincture of iodine, galvanic electricity, or galvano-puncture, are, all of them, recommended and practised. But all these modes of treatment having already passed under our notice in preceeding pages, in which we have considered the general treatment of hydrarthrosis, a further reference here to their characteristic effects and relative values would be needlessly repetitious.

## SPRAINS.

### SPRAINS OF THE FLEXOR TENDONS.

The lesion ordinarily known as *clap of the back sinews*, or *broken down*, is an injury of the general nature of sprain of the fibrous structure of the posterior part of the cannon region. It may be either metacarpal or metatarsal, and consists in a diseased condition of either the tendons of the phalangeal flexors or their sheath, or, according to Williams, of the reinforcing ligamentous band which, situated below the knee and hock, extends from the

posterior fibrous covering of those joints to the tendons of the flexor perforans.

*Etiology.*—Among the causes from which this condition most commonly arises are those to which lacerations of the fibrous textures are commonly due by reason of their forcible over extension. As a natural consequence, animals engaged in hard and heavy hauling, which involves the extensive stretching of these inelastic fibres, are the most frequent sufferers from sprains of this class. A single misstep, a sudden slipping on an icy or oily surface, may be sufficient to cause the lesion ; its sudden appearance in the racer, either while training, or while engaged in the struggle for which his training is designed to prepare him, is a sufficiently common occurrence to suggest the true solution of the phenomenon. The hunter and the steeple chaser, as they are exposed to the danger at its maximum, become the best examples and evidences of the methods most liable to produce this variety of sprained legs.

*Symptoms.*—The symptoms of these lesions are usually sufficiently distinct and intelligible. Lameness is commonly present, sometimes in a very marked and at others in a very slight degree, as determined by the amount of the violence to which it is due. On passing the hand over the parts, a swelling may be felt, which may be perhaps but a slight and single



bulging backwards, or it may be a diffused enlargement along the track of the tendons, with a development of heat and pain ranging in degree from the slightest to the severest. The attitude of the horse, as he stands with the lame foot flexed and resting on the toe, with the heels elevated, sufficiently suggests the true state of things to the mind of the experienced and observant surgeon.

When the sprain of the metacarpal or metatarsal region becomes a serious matter—and it is seldom otherwise—it is, however, less a lesion *per se*, than from a consideration of the peculiar resulting condition in which it may leave the tendons and ligaments. A chronic thickening of the parts, with a gummy condition of the leg may be included in this, and there is a plastic infiltration which alters the general aspect of the back sinews and interferes with their general functions by rendering them adherent one to the other. It is from this chronic condition of the lesion that serious trouble is to be apprehended. The tendons being prevented from exercising their proper functions, become retracted, and then follows the peculiar change which is designated as knuckling at the fetlock—an evil of serious character, and which not only demands the application of skilful surgery, but too often fails to become amenable to its benefits.

The treatment indicated for sprains of this region, and it is one which nearly all writers agree in recommending, consists in local applications, by some of hot and by others of cold water—and hot fomentations, often repeated and aided by warm bandages, are indeed, in many cases, followed by excellent results. By others, however, showering with cold water, cold douches and cold water bandages are preferred. Local topical treatment has, without doubt, its important advantages but whatever these may be, they are seldom, if ever, effective in preventing the exudation through the meshes of the injured structure, which, though a natural necessity for the repairing process, must, if possible, be kept under such control as will prevent the extensive chronic alterations which have a tendency to supervene. It is for this reason that early resort should be had to remedial measures. These, as nearly all the writers agree, consist in counter irritation by means of blisters or alterative ointments, to be followed, if ineffectual, by firing and operation, which, in the opinion of many, furnishes the only means by which good horses, under such circumstances can preserve their usefulness and value. It is Percivall who says—"By the firing iron have "horses originally worth their hundreds of pounds "sterling, been raised from knacker's price to their

“former value. By the firing iron has many a broken  
“down hunter and many a racer been joyously  
“restored to his station and rank in the field where  
“his proudest laurels have been won.”

But with all these various therapeutic indications, there are two others which the attending surgeon cannot afford to overlook and, when necessary, to insist upon. The first is proper shoeing. If a low, thin heeled shoe is a predisposing condition of the development of sprain of the back sinew, the indication for its prevention will be to look for relief in a high heeled shoe, in order to keep the tendon in a state of relaxation.

The second is long rest. It must not be forgotten or overlooked that from the structure of the tissues involved in the repairing process, the work of complete cicatrization is a slow and tedious one.

#### RUPTURE OF THE SESAMOID LIGAMENTS.

We are disposed to think that much that has been uttered by authors as particularly applicable to this species of injury has been, in some measure, unnecessarily written, and that much that has been said on the subject of sprains of the tendons applies equally to those of the superior sesamoid ligament. Of similar structure, the composition of both being the same white, inelastic, fibrous tissue, though

having, it is true, a different function, yet, as they both act as supporting and strengthening elements of the fetlock, they must need be exposed to similar injuries, arising from the same causes, and their manifestations should become, therefore, of very much the same character. The principal difference lies in the circumstances that the location of the swelling, when limited to the ligament, is a little more forward and in front of the tendons, and varies therefore from that which occurs when the tendon is the immediate seat of injury.

There is also a peculiar lesion of this ligamentous apparatus, which we have frequently met with, especially in American horses, consisting in a complete rupture of one or both branches of this ligament, as they are inserted at the apex of the sesamoids. We cannot accept the theory that this is essentially a lesion of the suspensory ligament, as held by some authors, since the same kind of accident may and does, in fact, occur by the giving way of the inferior sesamoid ligament.

The first mention of this disease of the ligamentous structure of the fetlock was made by our friend, Professor A. Large, in an appendix to an American edition of Stonehenge on "The Horse, in the Stable and the Field," published about twenty years ago.

The disease is a peculiar one, and the suddenness

of its appearance, with its occurrence in different feet separately and without discernible cause, proves that the parts have been the seat of some latent disorder or some change which must have been for some unknown time in progress. No class of animals appears to be specially subject to attack, although there are circumstances of peculiar liability, as for example the protracted stabling of animals which are long kept unemployed, as racing horses, kept from their accustomed exercise during the discontinuance of racing and in inclement weather. Although the history of these cases is a uniform one, there is still some difference in individual cases, in the manner in which the symptoms make their appearance. In some of these the lameness will suddenly manifest itself in one or both feet of a biped, either fore or hinder, quite in the absence of any known cause, as a misstep or the like, and it may either appear in a very severe form, or only become discoverable by a slight irregularity or uncertainty of gait while walking, much resembling in this respect the action characteristic of an acute attack of laminitis. Though closely examined throughout the entire extremity, the parts fail to reveal any well marked changes. A little swelling, perhaps; a slight perceptible heat at the fetlock, and often an increase of pain on lateral pressure over the sesamoidal



region, may be all. In the stall, the patient may be observed to prefer the recumbent position, and can only with difficulty be made to support himself on his feet, and when compelled to stand upright, betrays the pain which it occasions by the swaying movement of the body as he shifts his weight from side to side.

The manner of the access of the disease is sometimes quite a surprise to the inexperienced. The animal has perhaps been kept at rest in the stable, in consequence of his lameness, and has been for an indefinite period under treatment, without any distinctly marked symptoms or external manifestations, when at some unexpected moment he is found lying helpless in his stall, with one or both of the fetlocks apparently fractured. The standing position has become impossible—the foot no longer rests on the sole, but rather on the back of the heels—the toes point upward, the fetlock is almost in contact with the ground. Nor is it very unusual to encounter this same state of collapse under other circumstances, and without the preliminary or premonitous lameness. But when this occurs, it is while the animal is performing his usual labor that the collapse takes place. For example, although he may neither be at heavy work, nor moving rapidly, but simply traveling at an ordinary and moderate gait, such as he has long been accustomed to, a change may suddenly

occur in his movements; his step will shorten, and he will suddenly stop, apparently attacked with sharp and excruciating pains. He betrays great uneasiness, becomes evidently unable to stand, and falls on the spot. If urged to rise he makes a violent effort to regain his feet, and this completes the trouble; it is the final struggle, and it ends in lacerating the remaining fibres of the ligaments, and causing the foot to assume the peculiar appearance alluded to, by the lowering of the fetlocks and upward pointing of the toes.

From the numerous post mortem examinations we have made of injuries of this class, we have become convinced that the true seat of disease is not, strictly, the ligaments alone, from the fact that in the many legs we have dissected for purposes of inspection, we have never failed to discover fragments of bony tissue at the points of insertion of the ligaments, where they had been torn from the bone. If the superior sesamoid ligament had been the seat of the lesion, the fragments would belong to the apex of the large sesamoid bones, but if, on the contrary, the lesion was upon the inferior ligaments, the fragments would be from the base of the bones, or the portion of the fibrous pad, which occupies the posterior face and superior extremity of the os corona, upon which they were inserted.

Great care is demanded in the diagnosis of these cases. If the truth is to be discovered, the investigation must be of the most rigid character, and in point of fact all that can be assuredly determined under any circumstances amounts only to the discovery of grounds for a reasonable suspicion and a conditional hypothesis, which can only be settled absolutely by the final test of the upturned toes, and then the chances of successful treatment will all have passed away.

But little can be said in respect to the treatment of this lesion. Splints and bandages, or other artificial supports may be employed to keep the foot in proper condition, and to support the fetlock, and the patient may be shod with high heeled shoes, or may be put in slings, if he will stand. But although these appliances are indicated, we are constrained to say that our own experience has been so discouraging in our attempts to overcome the evil and the results so uniformly negative, that we have been at length driven to the theory that a report of a case of injury of the suspensory ligament and a record of a mistaken diagnosis form but a single *variorum* statement of the same incident, and can be easily subjected to a double or single interpretation, at pleasure.

Cases have occurred in our own practice, in which

we have made a diagnosis of incipient rupture of the ligaments of the fetlock, and after keeping our patients under treatment for weeks and months, have ordered their discharge in an apparently improved condition, only to see them break down the very first time their fetlock joints were subjected to the stress of a performance of their normal physiological functions.

Quite evidently the period which marks the completion of the breaking down process marks also the end of the possibilities of curative surgery, while at the same time it indicates the moment when it becomes a duty to call upon the knacker to terminate the miseries of the incurable sufferer.

#### SPRAIN OF THE FETLOCK JOINT.

The fetlock joint is an angular ginglymus, or perfect hinge, in which but two normal movements, those of flexion and extension, can occur. Lateral motion is extremely limited, almost entirely wanting, in fact, on account of the resistance of the lateral ligaments, which unite together the four bones which compose the joint. When a sprain of this articulation occurs, it is as the result of either excessive flexion or extension, or of some violent force applied laterally. There may also be tearing, a partial laceration, and even a complete rupture of the

fibrous apparatus, by which the bones are bound in their place.

If the excessive motion has taken place at the moment of the flexion of the joint, the sprain will be on the *anterior* part of the articulation, and will be so designated; or *posterior* when occurring on that side, or *lateral external* or *lateral internal*, according to circumstances of location, otherwise.

In a sprained fetlock the pain becomes at once manifest, and its seat may be ascertained immediately after the injury has been received. The inflammation rapidly supervenes, and the development of the symptoms which accompany it will correspond with the severity of the injury. The intensity of the pain is greatly aggravated by the increase of the inflammation, and this again is soon followed by a large swelling of the part, which may soon indeed become sufficiently extensive so entirely to surround the joint so as to render it a matter of difficulty positively to define the extent or even to determine the true nature of the lesion. The soreness is excessive, and its expression may be taken as a measure of the severity of the existing injury.

A slight tenderness, rapidly passing off, indicates nothing worse than a simple distension of the articular apparatus, comparatively harmless; a severer and more continuous pain implies over-



stretching, with partial laceration of ligamentous fibres; a pain at once severe and increasing will usually indicate an injury of a character correspondingly serious.

The lameness by which the various degrees of pain are manifested may vary in its expression from a mere timidity and caution in placing the foot on the ground to its complete disuse, when the animal carries it in the air and hops on his three sound limbs.

The swelling which exists in a sprained fetlock is at first œdematous and warm, and comparatively painless. It surrounds the joint and extends more or less below or above it, but before long may be observed to extend from the subcutaneous cellular tissue, where it was first limited, to the synovial membrane, (articular or tendinous), where there is an accumulation of synovial fluid, which fills up the joint, increases the pain and forms especially on each side, above and below the sesamoids, true windgalls, hard, more or less elastic and compressible and very painful, not only upon pressure, but sometimes to the mere touch. While the fetlock is the seat of this highly inflammatory condition, the pain endured by the patient will, according to its degree, be evidenced by the position in which the diseased leg is held, by the manner in which it is placed on the ground, and often by the general

condition of the patient. In serious cases the leg is carried in semi-flexion, in order that it may be relieved from contributing its share of support to the weight of the body, which is then of course carried by the three sound limbs; or if possibly the pain exists in a degree too slight to interfere materially with the act of locomotion, the limb will be used, but only with great hesitancy, and will be lifted with an unusual quickness. In cases of mitigated severity an antero-posterior motion or balancing of the leg may be sufficient to relieve the possible pressure of the tendons upon the distended synovial sac. The general symptoms will vary with the severity of the local trouble and with the impressionable susceptibility of the patient.

The terminations common to all inflammations occur also in sprains of the fetlock. They end in resolution or suppuration, or lapse into the chronic state. The first, in cases of various degrees of severity, is the most common. When the lesion is but slight, the inflammation and swelling soon subside, and the limb soon resumes its ability to carry weight and perform freely its proper and normal movements. The same stages of recovery occur in severer cases, but with less rapidity, proportioned to the degree of the injury and the recuperative power of the patient's constitution,

But suppuration is comparatively a rare result, not generally observed, except when the sprain is complicated with some lesion differing from that of the ligaments, as a fracture or some special injury of the bones, in which cases all the symptoms of suppurative arthritis soon appear. But if suppuration is rare, the establishment of the chronic condition is not.

Serious alterations of all the tissues of the joint may be expected to follow severe cases of sprain of the joint itself, the liability including all the constituents of the articulation, comprehending the bones, the ligaments and the synovial membranes, with both the suspensory and the motor apparatus. The bones may undergo an enlargement of their articular extremities, and sometimes of the first, or even the second phalanx, the ligaments suffer induration, with morbid hypertrophy at their points of insertion and the tendons undergo tumefaction in their own structure, with induration of their cellular tissue or of that which surrounds them. These various changes are slow in their development, and it is only after the subsidence of the acute inflammation that their existence can be accurately ascertained.

When the chronic character has become established, it will also have brought with it a permanent lameness, varying in degree and character, according to the nature and intensity of the lesions which interfere

with the regular functions of the several elements of the joint.

Even when the inflammation has terminated by resolution, a sprain of the fetlock is always a serious evil. The joint becomes permanently weakened, tender, and painful, in varying degrees, corresponding to the intensity of the symptoms attending the original injury, with a predisposition to swelling and soreness, and inability, frequently, to tolerate even the moderate and regular exercise to which it has long become accustomed; and the lameness becomes permanent.

As with sprains otherwise located to which we have alluded elsewhere, those of the fetlock occur principally as the result of missteps; sudden slipping, outwardly or inwardly, resting the leg in a strained or contorted position, as on an oblique surface; and more particularly, as the result of an excessively rapid gait, as in training, racing, hunting or steeple chasing, and the like. Among the most efficient causes are badly constructed roads, especially such as are excessively convex on the crown and sloping at the sides, and on which it is impossible for the animal to preserve the proper vertical position in the bony columns of the leg, or the requisite directness in the pull of the muscles. A sprain may also easily follow the violent struggling of an animal to

liberate an entangled foot from the obstruction of a broken pavement or frozen rut which has entrapped it and it is an occurrence common enough where there are street rail tracks waiting to crash the feet of beast. They are often received while traveling rapidly on rough and irregular roads, or when carrying a heavy rider or moving a heavy load, and they sometimes occur though a predisposition, arising from some abnormality of action or conformation, as, for example, in an animal affected with a tendency to knuckling.

The various degrees and lesions of sprained fetlock are of course suggestive of a like variety of indications as to modes of treatment applicable to the different classes of lesion which must be encountered.

In the matter of treatment the first indication is the prevention of the development of excessive inflammation, by the use of cooling applications, repeated and continued, in the form of baths, and bandages kept constantly wet. The agent employed is either simply water or medicated compresses, or salted water, with the addition of acetate of lead, or sulphate of iron, or perhaps phenic acid. Massage of the joint is often strongly commended. This treatment consists of various manipulations by the hand, applied with repetition from simple friction to severe pressing and continued for hours, and followed by pro-



ducing more or less passive motion in the affected parts. It is a prudent measure however, to follow it with a supplementary application of supporting bandages snugly adjusted. The parts are sometimes previously wrapped in soft pads of oakum, either dry or moistened with some medicated mixtures. But the application of dry compressive bandages, with splints of firm pasteboard, or gutta percha, or the various preparations of dextrine, as used in human surgery is a better and wiser measure. The padded compressive bandage of Vatel, moistened with Goulard's extract, or poultices of astringent material, will be found very beneficial. Zundel's excellent prescription cannot easily be improved. It consists in an immovable plaster, composed of one ounce of pulverised burnt alum, mixed with the whites of half a dozen eggs, carefully and thoroughly applied, in order to form a mould, as in a case of fracture. This soon consolidates over the parts and insures a solid and symmetrical pressure upon the joint, and by precluding all possible motion contributes one of the most essential conditions of recovery in a most efficient manner, and to any desirable extent. The continuance of the appliance for a week will frequently end in perfect recovery, and if that period should be insufficient, it is but required to extend the time a little, to accomplish the result. This part of the

treatment may be safely left to the direction of the "nurse."

Blisters, or strong liniments, such as the oil of cantharides, may be employed with similar effect though varying in their mode of action. They are indicated in severe cases, after the subsidence of the inflammation, and are not only serviceable through their salutary influence as counter-irritants, but also by performing the functions of bandages or other restraining dressings, by means of the crusts or scabs which they form by mixing with the serosity which exudes from the skin and dries in the form of an extemporised moulding envelope, or pseudo splint.

The emollient treatment recommended by German veterinarians cannot appeal to any lengthy record of accomplished successes for a favorable verdict, or general adoption. The good results claimed for it are not frequently or tangibly present, and it is quite too apt to lead or assist the formation of the suppurative termination, which we are well aware is a complication altogether too likely to become the precursor of the most unfavorable of results, to be risked by a prudent practitioner.

When all milder means have been attended by failure, and the disease has attained the chronic character, more energetic treatment must of course be instituted. In this the alteratives and absorbents

must be given a place among topical applications, and among these again the ointment of iodide of mercury is conspicuously advantageous. But above them all, the actual cautery, in lines or points—as we have repeatedly urged in respect to kindered ailments of the horse holds the preeminence, in the certainty of its beneficent effects. Bouley pronounces it to be the remedy *par excellence* against the chronic articular swellings which follow the sprain of joints: a renewal of the application, may however, be sometimes necessary.

#### KNUCKLING.

This deformity consists in a deviation from their normal direction of the bones of the fetlock joint, caused by their straightening. It can scarcely be considered a genuine disease of that part of the leg, however, since it almost always occurs as the result of disorders affecting other parts of the digital region. Among the diseased processes of a chronic nature of which it becomes the consequence and sequel, may be enumerated ruptures of tendons and ligaments, with swelling and plastic infiltration; hydrarthrosis of large size; large windgalls; and chronic affections of the phalangeal region, such as ringbones; or it may complicate and supplement severe surgical operations upon the foot—or it may result from old

diseases or deep punctured wounds of that member. All of these constitute conditions involving the same result and effect, in the long rest to which the tendons and ligaments are subjected, and the gradual retraction of their substances culminates at length in the pronounced immobility of the joint.

All these may be fairly characterized as traumatic or symptomatic causes. But there are other causes as well, to which the idiopathic designation may be applied. Among these may be included a predisposing tendency or malformation, as when the pasterns are already disposed to assume a too upright direction; or an improper shoeing, which may facilitate their development by increasing the strain upon the tendons; or again, it may be induced by some peculiarity in the kind of labor to which the animal is subjected, which causes a special or excessive strain upon the resisting power of the fibrous tissues, beyond their ability to sustain.

The deformity is slow in establishing itself, but is not without certain progressive steps or degrees; before reaching its completed growth. The respective duration of these progressive periods, varying with different patients and cases, admits of the arrangement of the process into three degrees or stages of growth.

The first of these stages or degrees exhibits all

the bony levers of the digital region, the cannon bone the os suffraginis and os coronae, in a nearly straight vertical line, or it may be an aggravated condition of the upright pastern.

In the second degree the articular levers unite to form a very obtuse angle opening backwards, with the apex turned forward at the centre of the articulation.

In the third degree the first phalanx is greatly inclined from before backwards, and with the cannon bone with which it articulates, forms almost a right angle, opening backwards in such a manner that a line drawn vertically from the apex of the angle, or centre of the joint, would pass down in front of the toe, on which then the foot generally rests.

There is in this case an almost total dislocation of the fetlock joint, the natural coaptation of the articular surfaces as it exists under normal circumstances, existing no longer.

From this description of the case, with the attendant circumstances, it will be readily seen that the symptomatology of knuckling at the fetlock is very simple. But aside from the deformity already described, there are other accompanying conditions to be noticed. Among these is the peculiarity in the appearance of the tendons, which in some instances can be located only at one given point of their length,



while in others they may be traced throughout, from the knee or the hock, quite down to the fetlock. This consists in a hard swelling painful on the pressure, even when of long standing, and the more so when the tendons alone are involved than when it has its seat in the suspensory ligament. While at rest, the leg is spared from its share of the duty of sustaining the weight of the body, but when put to work the hesitancy diminishes and the foot is at once placed on the ground with some degree of confidence and firmness. But there is still a peculiarity visible in the gait, which betrays an irregularity, and a liability to stumble, essentially characteristic of the case, and which is either occasioned by the soreness resulting from the disease which originally caused the knuckling or may be merely a mechanical effect of some interference or partial immobility attending the contact of the articular surfaces. The peculiarity is principally in the method of planting the foot, and the limited action of the knuckling joint, dependent upon the degree in which the deviation from the normal symmetry of the bony levers has become established.

The animal which is knuckled at the fetlock is in a continual state of fatigue and suffering, and when the disease exists in both legs of the same biped can only with difficulty maintain a standing posture, except

for a limited period. And when lying down, it is only by compulsion that he can be brought to forego the comfort of the recumbent position, and to throw his weight once more upon his crippled legs.

The prognosis of this diseased condition of the fetlock, however it may have originated, is never otherwise than serious, as must be readily inferred from a consideration of the important relation borne by the disordered articulation towards the great general function of locomotion, and the danger of the impairment, or even of the total loss, of this essential endowment. Much discrimination consequently is necessary in the exercise of the judgment with which the probable measure of the injury is to be determined. An important point in the examination of a case is the discovery of the originating cause of an attack, since it is generally true that the knuckling which is of an idiopathic type is more amenable to treatment than that which is due to an attack of chronic periostitis, navicular disease, contraction, or other disorders which are themselves of a sufficiently formidable character, and in fact too frequently prove wholly intractable to treatment.

Two indications are present in the treatment of knuckled fetlock. The first is to prevent the deviation from their normal direction of the articular levers, when possible, and the second is to rectify the

deformity, if practicable, when it has established itself. The indication is thus simply to choose between the preventive and the remedial.

*Prevention.*—In an animal predisposed to knuckling by peculiarity of conformation, the first point which it is necessary to establish is the relation which may exist between the labor he is required to perform and his ability to perform it. This latter may be wholly lacking, and it may be necessary to discover some other mode of continuing his usefulness and preserving his value, by a change in the nature of his work.

If the cause which tends to produce it cannot be found in the condition of the tendinous structure, it must be sought for elsewhere. In other words, the symptomatic knuckling must be reached by indirect means, and if exostosis or a windgall is the primary lesion, the treatment must take that direction, in order to reach the knuckling. The theory is a very simple one—to remove the cause, helps to cure the disease.

If the cause is inherent in the tendinous structure itself, and it has become painful from the pathological changes which it has undergone, the first indication which presents itself is as much as possible to relieve the tendons from the probably unequal strain which is imposed upon them while

supporting and displacing the weight of the body. One of the best means for the fulfilment of this requirement is found in a methodical and scientific mode of fitting and adapting the shoe. There are large probabilities, perhaps unthought of by many, of palliative benefit, in this suggestion. Bouleys recommendation in connection with this comprehends "shortening the wall as much as possible; " especially at the toe, and to put on the foot a " shoe thicker at the heels, or better provided " with high heeled caulks, The shorter the toe " will be, the higher the heels will be raised; " the greater the relief of the tendons." The application of a peculiar shoe is sometimes advantageous—one having a very wide and thin web in front, with gradually narrowing branches, and increasing backwards in thickness, the heels being much thicker than the toe. It is made to project forward, beyond the front of the toe, and this affords a decided relief to the tendons while the animal is travelling. This peculiar shoe, however, is not the only one capable of affording relief in a case of knuckling, nor does it occupy the first place in the estimation of veterinary practitioners in respect to adaptability and value among other designs of the kind. These methods of treating knuckling, with the advantages derived from their adoption are

constantly illustrated by results in the field of practice.

*Curative Treatment.*—In essaying the treatment of the swelling which characterizes externally the lesion proper of the suspensory tendons, the first condition to be fulfilled is to relieve them as much as possible, by means of the shoeing just referred to, from the strain, and the pain resulting from it. When this has been accomplished, and the pain has been in a sufficient degree reduced, vesicatory applications, to the extent of the ability of the skin to tolerate them, are indicated, the patient being meanwhile turned loose in a box-stall, and permitted to assume any mode of standing he may prefer. The swelling and tenderness of the tendons may in the beginning be relieved by this treatment. But to secure a satisfactory result, the animal must be permitted a long and uninterrupted rest, as the only security against a relapse, while the only exercise that can under any circumstances be allowed, is that of moderate walking—and the wearing of a **high** heeled shoe must be perseveringly continued.

In the second degree of knuckling, or when the swelling of the tendons has greatly increased in dimensions, hardness, and duration, this revulsive treatment will be of no avail, and resort must be had to the cautery, with blistering. The firing must be



performed in lines or in points, and there is a possibility of a successful result. But the remark already made must be repeated, that the prognosis is always one of a very serious character, and the disease is never otherwise than exceedingly refractory to treatment.

The curative treatment of the symptomatic form of knuckling must be indicated by the nature of the diseases in which it originates, and will necessarily vary in correspondence with the primary disorder.

When the knuckling has reached the third degree of its manifestation, as characterized by the partial dislocation of the first phalanx, the resources of veterinary surgery will have been reduced to such mere possibilities of relief as may pertain to the operation of tenotomy, or the division of the tendons in their continuity, in order to permit the straightening of the phalanges.

The section of the flexor tendons, performed by the subcutaneous process, has proved very useful, especially in cases in which the disease had not yet reached too advanced a stage.

It is contra-indicated when the two tendons are united, and there can be no possibility that the stumps of the divided tendons will permit the foot to rest on the ground on its plantar surface. Nor will an operation be of any avail in cases which have

originated in exostosis or other chronic disease of the foot.

The space which remains between the divided ends of the tendons after the section soon becomes filled by a thick, yellowish, homogeneous substance, which soon becoming organized, and constituting a tendinous callus, furnishes in that form a new means of elongation to the shortened tendon, and restores it again to its normal proportions. A week may suffice for the formation of the callus, but its organization will require twice that period, and only after a consolidating and perfecting process for which months will be necessary, can the animal be considered fit for the resumption of his accustomed labor. Nor should he for a still longer period of time be subjected to an equal amount of labor or fatigue with a robust and uninjured animal, relapses are easy and frequent.

In the operation of plantar tenotomy by the subcutaneous method, two bistouries, otherwise designated as tenotomes, specially adopted to the case, are required, one having a narrow blade and a sharp point, the other being blunt at the end, with a curved blade, and sharpened on its concave edge. The safest position for the animal during the performance of the operation is undoubtedly the decubital, the leg being placed in forced extension by ropes secured above the knee and below the fetlock,

and pulled in opposite directions. Bearing accurately in mind the disposition and dimensions of the synovial sacs, which are found occupying the upper and lower thirds of the region of the cannon, the point will be indicated where the puncture—with the straight tenotome — can be safely made, which is the middle of the region. The importance of avoiding the infliction of accidental injury upon the nerves or blood vessels which run in close proximity with the course of the tendon, is a point which must not be overlooked. But this, according to Gourdon, may be easily avoided by the simple expedient of introducing the instrument upon the same side with the nerves and vessels, instead of towards them. Hence, the indication to operate on the inside for the anterior, and on the outside for the posterior legs. The line of separation of the tendons being made out, (provided they are not found closely united by plastic exudation) the straight tenotome is introduced perpendicularly between them until its point is felt on the opposite side, the puncture of the skin at that point being carefully avoided. The blade of the curved tenotome is then introduced through the opening and the tract thus made, and the straight instrument is withdrawn. Once in place, if it is the division of the perforans which is indicated the sharp edge is turned forward

against it, and in its tense and rigid condition a slight sawing movement easily effects its separation. On the other hand, if it is the perforatus which is to be divided, the edges of the tenotome must be turned backward, with a similar manipulation, the other details being the same. The same steps are to be observed when a double tenotomy is to be performed. Watchfulness and caution must also be exercised, least at the moment of severing the nervous structures, the pain should excite a struggle so sudden and violent as to cause the instrument to slip backward and divide the skin through and through, giving then rise to a severe complication of the operation.

The subsequent care of the patient involves only the simple and ordinary attentions. The wound readily heals, and the complications which are likely to follow, such as hemorrhages, or the division of nerves are not of an alarming kind. Those which might result from excessive cutaneous division, or injury of the synovial sacs, however, would be of a much more serious character. A condition of excessive extension of the fetlock is possible, but in many instances becomes amenable to treatment, by proper shoeing and other appliances. The most serious complication, is a recurrence of the original trouble, by a return of the knuckling, in consequence of the

retraction of the newly formed cicatricial tissue. This is a condition which can, generally, only be remedied by a second resort to tenotomy, with a diminished prospect of satisfactory results in the perspective, unless some undiscovered means should become known by which the sustaining and recuperative resources of the patient could be so augmented as to enable him to bear a second debilitating and exhaustive ordeal better than the first.



## CHAPTER VI.

### DISEASES OF THE FOOT.

A discussion which purports to comprehend the subject of lameness in the horse—practically of course, a matter of inquiry into its causes and remedies—but which fails to include a suitable reference to the kindred subject of the diseases of the foot of the same animal, must be judged as being neither adequate or complete, if not indeed, effectually a solecism, since a portion only of the cases of motor disability which demand attention from the veterinarian are in fact attributable to accidental or traumatic causes.

If any plea might avail, and we were disposed to offer one, for so important an exclusion, it would be sought by the present writer in the form of a reference to the translation heretofore made and published by him, from the excellent Dictionary of Zundel, of the diseases of that portion of the motor apparatus—and to which we beg leave, just at this point, to refer the reader. If our work is to prove unsatisfactory and incomplete either in our own view

or that of our readers, it shall not be because any part of its rightful contents have been relegated to another book. Accordingly, the present chapter will be appropriated to a survey, sufficiently ample, of the subjects included in the phrase which forms its title.

We have besides, become impressed with the interest attached to that point of the case which suggest its examination from the standpoint of comparative anatomy and pathology, and have been specially drawn to regard the observation of the similarities and correspondences of equine and human disease as in some degree a study of parallel and analogous phenomena.

We feel quite sure that a comparative study of diseases of animals in association with similar lesions in the *human finger* would be of interest and value to veterinarians, and we would therefore call the attention of the reader to the consideration of the subject of

#### PARONYCHIA.

as modified by its appearance in animal and man respectively; and herein we confess to have been partly moved and inspired by the suggestions that we received from the writings of Dr. C. Aubrion.

The diseases of the foot of the horse have received a large share of attention from veterinary authors, among whose writings may be found many disserta-

tions of great value and interest. They have all found their *raison d'être* in the practical physiological importance of the pedal regions, in the varying forms of the lesions met with and the danger of permanent disability to which the diseased animal is always subjected by the pathological changes which might remain in the surrounding structures as well as in the foot itself

Each of the various diseases of the foot proper have become the subject of separate and special attention by various authors in turn, and to this circumstance may be attributed the more or less scientific terms by which they are now familiarly known. But might not a change in this respect become an improvement, and would not a better system of definitions and a clearer classification result from a mode of designation which would refer to existing correspondences between the forms of disease as they mutually exist in men and the lower animals. That this would be the case, and that it would make far more simple and intelligible, and therefore more practically useful, the terminology of the class of diseases in question, by thus conforming it to that of the human finger, and considering the whole under the general and comprehensive title which we have proposed, we cannot doubt.

To realize more satisfactorily the propriety of this

suggestion we must consider it from the standpoint comparative—pathological—anatomy, and observe well the closeness of the parallel between the related ailments of man and the soliped.

Viewed anatomically, but little difference appears in the essential structure of the digital regions of these mammalia. Three short bones similar in structure and in general aspect, are found in each, the only important differences in their osteology consisting principally, *first*, in the fact that in solipeds there is found posterior to the articulation of the second and third phalanges, a small spongio—bony structure, of great physiological value, the small navicular bone; and *second*, in addition to the lateral wings of the third phalanx, of an apparatus of an elastic nature, known as the lateral cartilage of the foot, which forms a kind of belt to the region to which they belong, and are a part of another structure, (the plantar cushion) which we find less developed at the same point in man, consisting of the pulp of the finger.

The articulations formed by these bones in all species are of the same kind. They are diarthrodial and allow a similar motion, more or less limited, of flexion and extension. Besides the means of union provided for these joints, we also find that the active organs of locomotion which aid their movements are similar in man and the horse, and we also find in both

that the place of the extensors of the phalanges is the anterior face of the bone, while the flexors are inserted on the posterior or palmar surface. The anatomical arrangement, thus corresponding internally in both man and the soliped, is also similar in the aspect presented by a view of the superficial regions. Surrounding the bones and the joints which they form, and the muscles or tendons by which they move the anatomist also encounters not only the cellular tissue and the tendinous sheathing, but the elastic apparatus, composed of the plantar cushion and lateral cartilages in the horse's foot, represented by the (cellulo-adipose) digital pulp of the human finger--the whole being enveloped in a skin having a highly vascular dermis, excessively sensitive in man and possibly still more so in animals, where the podophyllous and the velvety tissue take its place--the principal difference being that while the epidermic secretion of the nail is incomplete in man, it surrounds the entire lower part of the digital region in the soliped, and constitutes the hard, protective horny box which envelopes and contains the whole.

It would be remarkable, indeed, if so complete an analogy of anatomical structure could exist without also involving a similarity of tendency to morbid action and its resulting lesions. Yet, although the resemblance may not be instantly obvious between



the *felon* which tortures the man, and the *founder*, the *corn*, the *quittor*, or the *punctured wound* of the foot which torments the horse, it will require but little reflection to establish the conviction that if there is any real difference discoverable between these forms of diseased processes, it is exceedingly slight, and of no great practical importance.

PARONYCHIA, or WHITLOW, is an inflammation of the digital structure in man, and is divisible, according to its development and degree of manifestation, into four species, reference being had to the tissues specially involved in each case. And what then is the nature of this inflammation in the soliped? What is *laminitis* or *founder*, but a congestion and inflammation of the dermis, with its various changes and stages? And what is a *corn* resulting from a bruise and complicated with suppuration, and involving the surrounding region with a greater or less extent of serious lesion? What is *quittor*—what is a complicated punctured wound of the foot, with diseased cartilage—and what of necrosis of the plantar cushion; the slonging of tendons; synovitis; arthritis, and the rest?

A general arrangement of the diseases of the human finger suggests their classification into four varieties and yields, *first*, *paronychia unguis*, or superficial whitlow; *second*, *p. cellulosa*, or *phlegmonous*; *third*, *p.*

*tendinosa*; fourth, *p*, *osseosa*. These forms are all found in the horse, and in addition, a *fifth*, which may be denominated the *cartilaginous*.

We shall now subject the whole to a review from the point of comparative pathology, with what result will be readily apparent.

*P. Ungualis*, the first, is also probably the simplest form of the disease. It is characterized by a superficial inflammation of the dermis, with the possible accompaniment of the suppurative process and purulent accumulation. Its seat is usually the root of the nail and it is attended with violent pain, and followed upon recovery by a greater or less degree of deformity of the nail itself.

If now it be duly considered that in horses the keratogenous apparatus is not limited to a coronary band or an external matrice, but has added to it the podophyllous and velvety tissues; and if it be remembered that a similar congestion and inflammation occur in both human and equine patients, how can we avoid the conclusion which identifies the manifestations which we observe in laminitis, such as the difficulty of locomotion, the lancinating pain, and even the disturbance of the general organism with that which may be observed in the human patient while suffering from the visitation of a confirmed felon?

And why may not that common cause of foot lameness known as the *corn*, be also appropriately assigned to a place with the *paronychia ungualis*? Though while looked upon as merely a blow, or a simple bruise, or only a contusion, such a hurt may excite no alarm and awake no interest, it has only to reach the suppurative stage and receive the name of a *subungeal whitlow* to become a new witness and furnish another testimony of the existence and the effect of the analogy we are referring to. The only noticeable difference being that which is caused by the special arrangement and design which results in the construction of the complete nail in the soliped.

As a second specification, we may refer to the comparative view of the subcutaneous or *cellulous paronychia* in man, with its characteristic tendency to suppuration of the subcutaneous cellular tissue, with liability to mortification and sloughing of tissues in various degrees. The severe injuries known as *caulking*; the *furuncle* of the frog; the deep penetrating wounds arising from *punctures* from pricks, and nails, and otherwise, as well as the complicated *suppurative corn*; all will naturally fall into the category of affections the characteristic accompaniments of which are so frequently seen in the suppuration, mortification and sloughing of

portions of the skin, in the keratogenous structure and at the elastic pad of the equine foot.

Our third reference is to the *tendinous paronychia* of man, when the morbid process has involved the tendons, if, in fact, it has not begun as a primary inflammation of the sheets of these organs. The severe wounds produced by *caulking*, which we encounter on the front of the foot, just above the coronary band, when both the skin and the tendon of the extensor pedis will sometimes slough away; and again the deep punctured wound of the middle zone of the plantar surface of the foot of the soliped, injuring the broad aponeurosis of the deep flexor of the phalanges, with the intensity of the suffering attendant upon the diseased process, and the length of time required for their recovery; all these features concur in establishing the strength of the resemblance which proves the mutual relationship of the morbid members of this third division.

Our fourth comparative review brings us to the consideration of the osseous form of paronychia *p. osseosa* in which it is characterized by an acute inflammation of the periosteum which so often terminates in necrosis of the third phalanx. We cannot in any case fail to find between this very severe form of lesion and a similar condition in the horse in the various traumatic injuries affecting his feet, and which are

accompanied with necrosis and caries of the os pedis, a correspondence too obvious to permit it to be over-looked.

The fifth item, or the *p*, *cartilaginosa*, may be considered as representing our common cartilaginous quittor, but can hardly claim to have a perfect analogue in man. Yet we may still recognize its radical connection with the form of previously considered types, if we do but bear in mind the peculiarities of its anatomical site and structure, and of the manifestations to which it gives rise while a diseased condition prevails.

The general similarity of pathological character in diseases which are common both to man and to solipeds is traceable more in their general manifestations than perhaps in some of the extreme niceties of pathognomonic details. But who amongst observing veterinarians, who have critically studied the varieties of lameness, with its distinctive phases of pain, from the most acute lancinating paroxysms to the most persistent and besieging aches, as expressed by the animal by change of posture and other instinctive movements aiming at relief, besides the general disturbance of the organism throughout including even tremblings, sweatings, groaning and tears who, it may be repeated can fail to recognize similar conditions in human sufferers for cognate ail-



ments, with their loss of sleep and of appetite, and intelligent statement of their own sensations?

But we need not pause at this point while in looking for the correspondences we are noting. When we consider the matters of diagnosis, of indication, and of treatment, the resort to antiphlogistic appliances, and to stimulating embrocations; the topical use of heat, of poultices and of vesicants; with the use of the lancet and bistoury for the liberation of purulent and other collections, and of the sharp instrument for the removal of mortified structures; the application of the tenotome; the amputation of parts; the injection of mild caustics into capsular cavities—in a word, when we carry out the parallel in diagnosis, in lesion, and in result, so easily traceable between the two classes of patients, we are compelled to allow the fact of the correspondences between the human and the equine races, in the analogous ailments common to both.

Assuming this to be as we have tried to prove and illustrated it, the question presents itself whether a change in the nomenclature of some of the diseases common both to horse and his rider, is not desirable, and if the following new system of terminology is not quite worthy of acceptance and adoption by veterinarians.

## PARONYCHIA.

## CLASS I.—P. UNGUALIS.

1. Superficial Caulking.—2. Laminitis.—3. Simple Corn.—4. Suppurative Corn.

## CLASS II.—P. CELLULOSA.

1. Severe Caulking, with slough of the skin and abscess at the coronary band.—2. Superficial punctured wound of the foot.—3. Punctured wounds by nails etc.—4. Abscess of the frog.

## CLASS III.—P. TENDINOSA.

1. Severe Caulking, with necrosis of tendons.—2. Furuncle of the frog, with slough of plantar cushion.—3. Punctured wound of the foot down to the plantar aponeurosis.

## CLASS IV.—P. CARTILAGINOSA.

Cartilaginous Quittor.

## CLASS V.—P. OSSEOSA.

1, Deep punctured wound of the foot, to the navicular bone.—2, Pricks by nail to the os pedis.—3, Severe caulking, with periostitis, ostitis and arthritis, terminating with the sequelae of necrosis, exostosis or anchylosis.

## APPENDIX.

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In order to bring our work to a symmetrical ending and at the same time to give due prominence among the causes of lameness in the horse to two important and interesting subjects, we have thought proper to assign a distinct place under a separate head to the consideration of *sprains of the loins* and *embolisms*, in connection with the general subject upon which we have been engaged.

### SPRAINS OF THE LOINS.

This term is applied to several diseases, varying in their nature and differing in their forms of lesion, but alike liable to give rise to the general disturbance of the functions of locomotion which, under its various subdivisions, we have been considering. Among these are often included sprains, due to muscular injuries; certain nervous affections: attacks of arthritis, and diseases of the spinal cord.

*Symptoms.*—Sprain of the loins, or as it is sometimes denominated, lumbago, is accompanied by loss of rigidity in the spinal column, from the withers to

the croup, and forms a condition which is always destructive of the harmony of movement which normally subsists between the anterior and posterior extremities. In consequence of this while in the standing posture, the normal habit is changed, especially in the hind legs, which are held farther apart than is natural; and the vertebral column is more or less arched, with perhaps a lateral curvature. Movement is difficult and painful. The animal lies down with difficulty and groans in the act, and in rising, only succeeds in the endeavor after repeated attempts, still betraying the suffering he experiences as all his movements require repeated efforts for their accomplishment. The abnormal flexibility of the spinal column is demonstrated not only by the fact of its actual excessive flexion; as shown in various motions of the body and extremities; but it may be detected also as he is standing motionless, in his regular attitude, by mechanically forcing the hind quarters into lateral oscillation by pushing him sidewise to which he yields without any violent effort to produce them, and apparently without suffering pain.

It is however when in motion that the weakness of the vertebral column becomes most conspicuously noticeable. Walking is performed with a sideling, balancing action of the extremities which is in fact a

stagger, and when the weight falls on the leg down squarely it is subjected to a sort of swing which causes the point of the hock to turn outward and the toe of the foot inward, the hinder feet being but slightly lifted and the flexion of the hock very limited. These irregularities of the hinder parts are yet more marked in the action of trotting, when the control of the legs seems to be nearly lost, and the patient interferes to such an extent as to expose him constantly to the danger of tripping himself, and he does in fact, at times drop suddenly on his hind quarters, though soon with an effort, recovering himself.

To be suddenly halted while in rapid motion, as in trotting, causes acute pain and prompts him to a quick and violent flexion of the hocks, and exposes him to the danger of a fall. In advanced cases the backing power is almost wholly gone, and he consequently loses his ability to resist the weight of burdens pressing from behind, while descending a declivity. This disability increases with the advance of the disease. In attempting the act of backing, it is accomplished, if at all not with a direct rearward motion, but in an oblique direction, and the deliberate and steady action of health and vigor is exchanged for a feeble, violent, sudden and jerky impulse. In turning about, though the fore legs may act freely enough, the hinder continue motionless, serving only



as a pivotal support, and at length acting suddenly and instinctively, from the necessity of avoiding a fall; the whole movement being involuntary and automatic.

In turning in a circle, (as in turning on his own axis) especially if it be one of small diameter the vertebral column becomes curved, both vertically and laterally, and the horse moves as if flexed laterally upon himself, and if during the experiment the speed of the motion is accelerated there will be imminent danger of a fall, from the inability of the hinder leg which forms the pivot on which the body revolves, (as in the former case) to rotate with sufficient rapidity to maintain the general equilibrium.

A burden placed directly on the back, of course increases the difficulty of walking, and in some instances renders it impossible; it is, indeed, very easy for a horse with sprained loins to fall under the mere weight of his rider.

Sometimes local tumefaction, with pain, accompanies the sprain. There is then a special sensibility of the region under the mere pressure of the hand though there seems to be no abnormal appearance, owing probably to the chronic character and the deep seated situation of the disease.

*Pathological Anatomy.*—The lesions which a post-mortem examination reveals in animals which have

during life exhibited the symptoms which we have described are as might be expected of an essentially serious character, and affect various portions of the vital apparatus. Bouley speaks of their presence in the vertebral column; in its muscular structure; in the posterior aorta; in the coxo-femoral joint, and in the femoral nerves. But again the symptoms of that disease have also been observed in chronic affections of the spinal cord; in diseases of the kidneys; and connected with the existence of large neoplasms in the sub-lumbar region. Yet there are cases where no really characteristic lesion can be found, and the disease is certainly of a rheumatic nature; a true lumbago, in fact, or rheumatism of the loins. Its most common seat is the vertebral column, where it may be found both in the intervertebral articulations and the vertebræ themselves. In the first situation it may be found in various degrees of manifestations. In one case the intervertebrate menisci will become distended, or possibly lacerated in their continuity; in another the fibro-cartilages of the articular surfaces will have undergone a process of resorption, in a portion of their extent, and possibly to such a degree as to involve the bony structure itself in the disease, under which circumstances, a form of arthritis may result; and even ankylosis may supervene as a final termination.

Again, a peripheral periostitis may have appeared as the vertebral articulation had become affected, in the form of an irregular bony deposit—and it is not an uncommon circumstance to meet this variety of ankylosis, involving at once several of the vertebræ. Specimens are numerous in which not only the lumbar, but the dorsal vertebrae are united in a long and solid rod, from which all signs of intervertebral articular ligaments have vanished.

Injuries of the muscles may exist, associated with those of the bones, as well as independently. Thickening of the ilio-spinalis, lesions of the psoas from simple degeneration, and purulent collections are also to be included in this category.

The lesions met with in the posterior aorta will be considered in another place, when our attention will be directed to embolisms of that artery and its branches.

In respect to lesions of the coxo-femoral articulation, Rigot reports a case in which he found “a recent rupture of two internal ligaments of that joint, without displacement of the articular surfaces or laceration or distention of the synovial or of the capsular ligament”.

*Causes.*—Sprains of the back will naturally most frequently occur among animals which are compelled to bear heavy burdens, or from any cause undergo

severe strains in that region of the body. Heavy cavalry and draught horses are consequently the most frequent sufferers from this lesion. Under normal circumstances, in consequence of the arched form of the vertebral column, the weight which it is required to sustain becomes evenly distributed among the bones composing it. But this equality of pressure cannot always be assumed. A weight in excess of the strength of the animal will at times overcome the curvature of the spinal arch, and the inter-articular ligaments become stretched, and sometimes lacerated and ruptured. Heavy work, over rough and irregular roads, and the wrenching motion which accompanies the effort to first put an excessive burden in motion are mostly responsible for the existence of the injury. Traveling upon slippery ground, with shoes worn smooth, should also be placed among the causes which may be enumerated. And again, an unusual length of body, with breadth across the loins, may be recognized as probably predisposing causes. It has been cited also as having a connection with the act of casting for surgical treatment, either at the moment of throwing the animal, or as resulting from his struggles while under the surgeon's knife. But though we must usually look for traumatic injuries as mainly implicated, we must by no means ignore the effects of pain inherent in the muscular system,

and the dorso lumbar region particularly, as pertaining to the etiology of lumbago. Nor can exposure to cold, a sudden arrest of perspiration or the influence of the rheumatic diathesis be omitted from the list of possible originating causes.

*Diagnosis and Prognosis.*—The prognosis of the disease will of necessity be modified by the pathological lesion which accompanies the morbid process. Thus if it be lumbago, it may offer a more favorable promise than would be afforded by a simple muscular sprain, which will also be of a less serious character, considered in reference to its disabling effect upon the value of the animal as a laborer, than an ankylosis, which in the same relation, is less unfavorable than when the lesion is of such a nature as to involve the integrity of the circulating apparatus. The importance of great thoroughness, then, in searching for the correct solution of the various phenomena which properly constitute the case is obvious, though it is to be feared that many cases of professed investigation have been performed with but scant scrutiny, and correspondingly unsatisfactory results.

The symptoms described are to be recognized as the manifestations of a simple sprain, simple both in its nature and its pathology. But if this is associated with a more serious lesion, such as an extensive injury of the articulations and of their structures,



their significance will become more marked, and a correspondingly closer inspection of all the details should follow. We may thus be led to a better comprehension of the condition of the vertebral column, which will be found to have become more sensitive to pressure and with the lateral flexion more marked, as shown by the oscillating and staggering motion of the animal, as these become confirmed and aggravated.

In sprains confined to the muscular structures alone, the symptoms are less marked, the loins are sensitive and flexible, and there is a greater degree of general rigidity.

When the lesions are in the coxo-femoral joint, there is rigidity at the back and excessive oscillation of the hind legs in the act of walking.

The appearances due to embolism will be considered as we advance further in our study of the subject.

According to Bouley, when the irregularity of the posterior action occurs as the result of lesions of the femoral nerves, serious in degree, though not sufficiently severe to terminate in paralysis, a peculiar manifestation presents itself during the act of walking due to the excessive flexion or humping of the back, and suggestive of the idea of a shortening of the hind quarter, causing the contour of the spine to resemble that of hyena.

A case of genuine lumbago will be recognized by

the gradual subsidence of the symptoms, and their disappearance under judicious treatment.

The serious general affections in which the symptoms under consideration originate, are too evidently associated with their distinguishing signs and the changes, and functional disorders of the implicated regions, as well as the economy at large, to be easily mistaken for the results of a simple sprain.

*Treatment.*—Though it is quite evident, from the considerations which have occupied our attention, that the radical recovery of patients laboring under the diseased conditions which we have been examining is not a matter of very common occurrence, or very easily accomplished by the appliances of human skill, yet there will always be certain indications of treatment within reach of the experienced and accomplished practitioner, which cannot justifiably be omitted, or depreciated, especially in the presence of an indeterminate or doubtful diagnosis.

The prime, and in every case indispensable indication is *rest*, as perfect and undisturbed as possible. The next, and closely auxiliary, is the abatement of pain. For this purpose, when the season renders them proper and allowable, the cold douche or bath may be resorted to. Irritating frictions and charges, or even repeated blisters are beneficial, as by the rigidity which they impart to the affected region,

especially if the animal is kept in a condition of quiet by being prevented from lying down, or is secured in slings. The actual cautery in lines is often recommended in old cases, as a final resort, but must be applied while the animal is on his feet, since the effect of his resistance of the violence necessary to cast him could not be otherwise than injurious, to a dangerous degree, by aggravating his lameness.

A resort to electricity in attacks evidently due to a rheumatic diathesis is a plan of treatment which is not without its advocates and endorsers.

In cases due to disease of the blood vessels, there seem to be no therapeutic resources upon which to draw with any fair prospect of obtaining means of relief.

#### EMBOLISMS.

Internal arteritis, or the diseased condition of the membrane which coats the inner surface of the blood vessels, is frequently complicated by the presence of clots of blood in the vascular cavity, which have been formed in the capillaries, (or aneurysms when present) or in a vein, or even the heart, and are borne along by the circulating current until they lodge in an artery and obstruct or close its channels. The effect of such a lodgement of these migratory masses, or embolisms, is a disturbance of function more or less

serious, varying in its features according to the artery in which it has been developed. But the symptoms are in all cases recognized by the mortifications which are observed in the myotility, the sensibility, the circulation, and the calorification of the region supplied by the artery, the serious character of the changes of myotility being proportioned to the degree of obstruction securing in the duplicated vessel. If the arterial cavity has become wholly occluded, the muscular force is so nearly destroyed that the interference becomes practically equivalent to paralysis of the parts. In a case of partial or imperfect obliteration, there may, during rest, be no appearance of change in the manner in which the muscular function is performed, but the stimulus of exercise is no sooner felt upon the circulation than the effect becomes evident in an access of the lameness, with its special characteristics, which follows. The interference with the action of the muscles is very marked, and the affected leg almost wholly loses its power, and drags on the ground, the impossibility of bearing weight on it continuing until under the influence of rest the circulation becomes quieted, and the comparatively normal functions of the muscular apparatus return.

Attending the appearance of these muscular disturbances there are evident signs of severe suffering on the part of the patient. His entire countenance

betrays the fact. There is a contraction of the face; dilatation of the nostrils; acceleration of the respiration; abundant perspiration, with unsteadiness of posture and violent movements both while on his feet and when lying down. All the signs of intense pain are present. These appearances manifest themselves suddenly, and become more and more striking as the animal is kept in motion, to subside sooner or later and more or less gradually, perhaps to cease entirely, under the influence of rest and quiet.

With the obliteration of the large arteries of a region there is either a retardation or cessation of the arterial circulation beyond the point of obliteration, but the condition is different in front of it where the vessels are evidently in an enlarged form, in consequence of the reversed and reactive pressure of the retarded current, and the pulsation becomes correspondingly fuller and stronger at that point.

There is also some change in the temperature of the parts over which the obliterated vessel had been distributed. In a normal and healthy condition the temperature of the whole body is increased under the influence of exercise and an acceleration of the circulation. But the effect of a diseased artery upon the region which it is its province to nourish is to leave it cold and dry, and destitute of perceptible pulsations.



Such, concisely, is the general symptomatology of internal arteritis, and we are next to consider the subject in its special features, as it more immediately relates to the subject of this volume and bears upon the question of lameness.

#### EMBOLISM OF THE POSTERIOR AORTA.

This disease is a common one among those which afflict horse flesh. Its seat is in the lumbar region, and especially near and on a level with the aortic quadrifurcation. The extent and degree of the obstruction furnishes the measure of the intensity of the symptoms, which vary much in different cases.

The first degree is characterised by an irregularity of motion in the hind quarter, caused by rigidity in the extremities. The muscles act with diminished power and strength, and the result is a staggering gait, hesitancy in the action forward, and irregularity in the mode of resting. In other words, there is a loss of harmony and synchronism between the extremities in their respective action. The symptoms are the same that we have observed after violent distension of the vertebral column; in lacerations of the ligaments of the back; in injuries of the dorso lumbar muscles—in brief, such as we have described in the preceding paragraph as pertaining to sprains of the loins, But the differential diagnosis of the

two cases is easily determined by a reference to the symptoms which characterise that of embolism, to wit.

First, the aggravation of the symptoms under the stimulus of exercise, an effect which can be carried far enough to render the animal liable at any moment to fall as if paralyzed.

Second, the diminution of the temperature of the hind legs and the dryness of the skin covering them while every other portion of the body is covered with perspiration.

Third, the absence of pulsation, as detected by rectal examination.

In a more advanced stage of arteritis of the aorta, or when the obstructing clots have extended into the muscular branches of that vessel, the irregularities of locomotion become still more noticeable, and the symptoms of pseudo-paralysis are sooner induced under the influence of exercise. Another symptom appears in the relative development of the lameness in different legs. As there is not usually the same degree of obstruction on both sides, one leg will be more affected than its opposite, and the method of halting becomes more significant from that circumstance, until the induced motion ends in causing complete inertia of the limb. The association of these phenomena with a reduction of the temperature

and the absence of arterial pulsation in the parts cannot fail to establish and verify the diagnostic identity of the case, as distinguished from any other. The occlusion and its extent are variable in different cases. It may involve the aorta at its posterior extremity, or it may extend to one or several of the branches which form its quadrifurcation, and numerous cases of partial or complete obliteration of the internal and external iliacs and their divisions are recorded in veterinary papers.

#### EMBOLISMS OF THE ARTERIES OF THE EXTREMITIES.

The arteries of the posterior are more frequently subject to these affections than those of the anterior extremities, and it is not an unusual occurrence to encounter lesions of this kind in the femoral artery and its subdivisions which have extended to the popliteal, and even below it. Many reports of these cases have appeared in the various veterinary journals, of which we have ourselves contributed a number to the pages of the *American Veterinary Review*, some in which the lesions have extended in the femoral artery and its subdivisions, way down to below the popliteal. We are indebted to Bouley, Jr. for the first mention of the subject, in 1885, and since then many other reports have appeared, all of which present the same history and record the same

manifestations. These may be thus summed : lameness, increasing in its degree and intermittent in its character ; aggravated by labor or exercise ; diminishing or disappearing with more or less facility with rest and inactivity ; causing during its access, excruciating pain, mostly of a lancinating character ; inability to bear weight on the affected leg, amounting even, when the occlusion is perfect and extensive, to the inability of the animal to continue on his feet, and subjecting him to sudden falls ; absence of arterial pulsation ; diminished heat of the affected extremity ; dryness of the skin below the seat of the lesion, and in general, symptoms of severe constitutional disturbance.

As with the embolism itself, the disease in which it originates, the internal arteritis, is less common in the anterior than in the posterior regions, and a majority of cases have their seat in the hinder limbs. The first recorded case was reported in 1851 by Henry Bouley, who gives its history substantially as follows :

The animal was not at first lame in walking, but after a few minutes began to favor the near fore leg, and the continuance of the exercise was accompanied by an increasing lameness, to a point when bearing the weight of the body on the diseased limb became impossible, and the extremity was dragged on the

ground in a semi-flexed position, as if the extensor muscles of the fore arm had become paralyzed. If attempts were made to compel him to move, they were resisted, and he would throw himself on the ground rather than attempt a single step. When at rest his countenance betrayed signs of the severest suffering, shown by the contraction of the features and the acceleration of the respiration. There were weakness and instability of the extremities, and sometimes, while in violent motion he exhibited signs of suffering such as accompany the presence of violent abdominal pain. The surface of the body was covered with perspiration; with the exception of the diseased leg, which was from the fore arm downward, dry and cold. These symptoms would continue for a period of from twenty minutes to half an hour, when every thing would return to its normal condition—but only to undergo a repetition of the disturbance if again subjected to exercise as before. The post-mortem examination revealed a large aneurism at the origin of the left brachial trunk and its axillary portion, with embolisms in the following arteries—the sus and sub-scapular, the humeral, pre humeral, external and internal collateral of the elbow, and anterior and posterior radial.

The prognosis of these affections can seldom if ever be a favorable one. The fact that they totally



unfit the animal for labor of all description sufficiently determines the case and subjects the suffering patient to the final humane and fatal verdict, equally irrepealable and unimpeachable.

The obvious fact is that embolisms are generally incurable: a clot formed in a blood vessel can seldom be removed from the circulation. It is true that with time an anastomatic circulation may be established, and the collateral channels may by an increased development in the capacity of the vessels facilitate the flow of the blood to the parts which have been deprived of the sustenance which under normal circumstances would be theirs.

But in this there is only theory and hypothesis, which can never come into practical realization, except perhaps in vessels of diminutive calibre and insignificant importance, and which do not find a place among the organs or functions whose aberrations are to be studied among the accompaniments or causes of lameness.

Long rest, the free use of alkaline alteratives, stimulating frictions, hydrotherapy, electricity, and even vesicating applications: all these are recommended, but with what wisdom and practical benefit, must be left for future determination.



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